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Protect Your Data Center Equipment Investments

When Buying Racks & Cabinets, Focus On The Features You Need Now But Have An Eye On The Future

RACKS AND CABINETS are built to hold and protect every piece of equipment that runs your data center. Because of that, the decision of which racks and cabinets to purchase shouldn't be hastily made. Instead, you should focus on the features most important to your company and ensure they will fulfill your needs for years to come.

✓ *Know What's On The Market*

The first thing you should do when looking at racks and cabinets is research what's currently on the market. Companies offer full-sized 42U, mid-sized 26U, and 12U cabinets as well as racks with heights of 30 to 84 inches and widths of 24 to 36 inches.

Eli E. Hertz, CEO and president of Hergo (888/222-7270; www.hergo.com), says you should look for potential add-on items, such as overhead storage compartments, power and cable management solutions, and back and side panels. Different sized racks and cabinets paired with additional solutions can help you design a product that's perfect for your data center.

✓ *Pinpoint Your Needs*

Once you know what products and configurations are available, look at the types of physical features you need for your specific environmental needs.

"Establish what you need the cabinet to do," says Susan Wynne, senior sourcing specialist for Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). "If the equipment is noisy, you may want a sound reduction cabinet. If the environment is dirty, you may need a filtered cabinet. Even the area of the country is important, and you may need an air-conditioned or NEBS cabinet."

There are many other considerations you must make, including whether you have a sprinkler-based fire suppression system that requires NEMA 12 certified cabinets that keep out moisture, Wynne says. You should also consider built-in security measures, such as locked cages or other alternatives, if there is a lot of traffic in and out of your data center.

✓ *Check The Vendor*

Hertz says that a cabinet or rack purchase is significant and so the decision of which vendor to buy from is just as important. "You need to make sure that the supplier they have chosen has been in business long enough to have an established reputation in the market," he says.

Hertz says companies should be able to "grill the supplier on what they are actually going to be getting," and the vendor should be able to answer those questions by knowing

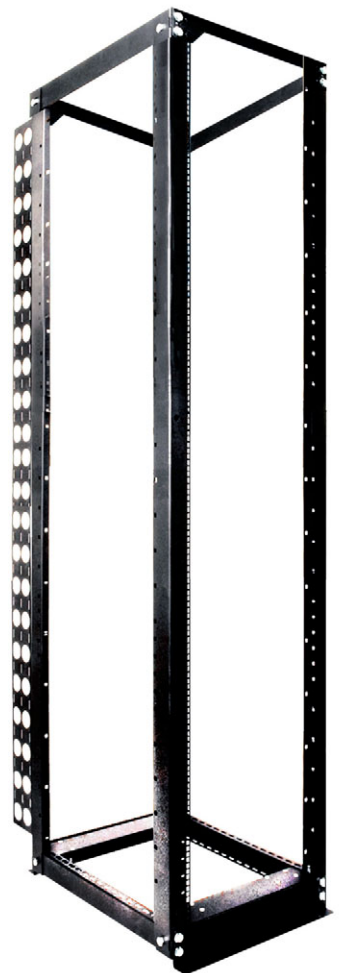
"the product from nuts to bolts." Think of the vendor as a partner in the purchasing process and make sure it gives you enough information to make the best possible decision.

✓ *Get The Right Fit*

In most cases, you've already decided which pieces of equipment to buy for your data center before you start shopping for the racks and cabinets to store them in. It's a great opportunity to measure each piece and come up with a mock configuration for how it will fit into the rack or cabinet.

"This ensures the cabinet is tall enough, wide enough, and deep enough to handle the longest piece of equipment to be populated into the cabinet," Wynne says.

But don't let internal space be your only focus, because the amount of space the rack or cabinet takes up is equally important. "Make sure the outside dimensions of the cabinet will fit in the designated location," she says. Whether you are purchasing multiple racks and cabinets to fill a brand new data center or buying one to fit into an existing setup, it's important to know every dimension. And make sure you leave adequate space for expansion in the future. If you don't, you could get stuck with a cramped and inefficient data center with no room for evolution. **P**



BUYERS' CHECKLIST

- ✓ Is cable management built-in, or does the rack or cabinet leave adequate space to neatly route cables?
- ✓ Does the rack/cabinet provide PDU mounting options such as brackets?
- ✓ Does the equipment you're mounting require tapped or M6 holes?
- ✓ Will you need to disassemble the rack/cabinet to get it in the room?
- ✓ Is the cabinet lockable to prevent potential security issues?

KEY TERMS

M6 holes.

Square holes common with rackmount equipment and server cabinets; they can be adjusted to a round hole with a cage nut.

Rackmount units (RMU).

Cabinets and racks are measured in rackmount units, with each RMU, or U, equivalent to 1.75 inches.

Specialty rack or cabinet.

A rack or cabinet designed for unique data center needs; common options include air-conditioned, seismic, and large cable bundle.

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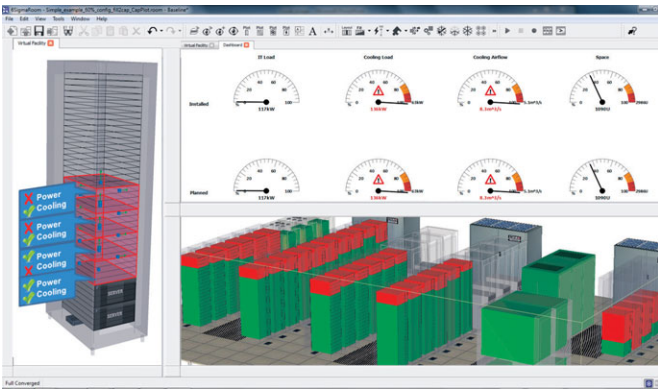
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FEATURED PRODUCT

Find & Recover Data Center Performance & Capacity

Future Facilities Helps Fortune 20 Company Get Back On Track



WHEN BUILDING A NEW DATA CENTER or making upgrades to an existing facility, companies are careful to plan ahead for capacity to make sure that the data center can handle network traffic, storage requirements, and other important employee and customer needs both now and into the future. But even the best-laid plans meet unforeseen challenges that, over time, will negatively affect data center capacity.

The data center at a Fortune 20 company was originally set up to support 980kW of IT load. But it reached a breaking point when its IT load grew to 688kW. Cooling became unavailable to portions of the IT load, and adding additional IT load was deemed too risky. Using the 6SigmaDC software suite, a series of IT load simulations, and the knowledge that most capacity loss issues are the result of space, power, and cooling fragmentation, Future Facilities and the company were able to immediately spot the trouble areas in the current state of the facility.

Future Facilities’ 6SigmaDC solution is designed to predict and visualize

fragmentation of infrastructure resources and integrate IT and engineering to ensure data centers are running at peak efficiency. It provides a variety of software modules for designing new data centers, planning out upgrades for existing facilities, or as a predictive DCIM tool for making better operational decisions that protect data center capacity over the long term. 6SigmaDC’s virtual model of a facility pinpoints design flaws, performance problems or inefficiencies, and ways to optimize your data center layout.

Visualize What Can Be Done

With 6SigmaDC, the Fortune 20 company’s data center managers were able to see a three-dimensional virtual representation of the data center and spot the load distribution and cooling issues inherent in the data center’s existing layout.

For starters, the facility’s IT configuration had evolved differently relative to the design assumption. The load wasn’t as uniform throughout the facility as originally planned, and the

density on one side of the facility was much greater than the other. Plus, the facility didn’t have redundancy included in the deployment plan, which means downtime and maintenance weren’t factored into the design.

Using the tools in 6SigmaDC, the company was able to simulate various new equipment installations and configurations to determine the overall impact on capacity. For example, it developed a plan to rotate a row of cabinets 180 degrees as the equipment inside was refreshed over time with the latest hardware. Other cabinet and infrastructure modifications were developed using the 6SigmaDC simulation capability. An optimized list of infrastructure and IT modifications were selected and in 6SigmaDC, sequenced and combined with the IT plans to form a unified data center road map that incrementally reclaimed the lost capacity while avoiding a major infrastructure overhaul.

After utilizing the multiple simulations and layering these changes together, Future Facilities was able to solve

almost all of the company’s capacity loss issues. Where the company originally had 137 racks and 964 pieces of equipment at risk for lost capacity (395kW, or 40% lost capacity), it cut those numbers down to 18 racks and 73 pieces of equipment at risk (29kW, or 3% lost capacity).

The company’s data center, with the predictive DCIM toolset 6SigmaDC, will be more energy efficient, which can save money over time, and will also be able to optimize resource utilization and as a result access the capacity potential of the facility and provide the expected level of performance.

FUTURE FACILITIES 6SIGMADC

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Provides a virtual model of a facility that helps to pinpoint design flaws, performance problems or inefficiencies, and ways to optimize your data center layout.

FEATURED PRODUCT

Storage That Isn’t ‘One Size Fits All’

Cloud & Big Data Storage Solutions Are Within Reach Of The Small To Midsized Enterprise

THE SEEMINGLY ENDLESS BARRAGE of data crossing your corporate network is doing a number on your enterprise storage. Backup times are increasing. Capacities are being pushed to their limits. New technologies are scrambling to keep pace.

For many enterprises, the answer to solving this problem has been to throw hardware at an underlying file system deficiency. But while that’s easy to do, it doesn’t do much to solve the underlying problem. You need to work with a partner that can help discover and identify the current and potential challenges in your storage setup and then design and develop an innovative and industry-certified storage solution tailored to your needs.

Area Data Systems has been doing that for more than 25 years.

Experienced Development & Support

As a Nexenta Premium Partner, Area Data Systems designs trusted open storage solutions designed around the NexentaStor software and backed by experienced development and support engineers. Area Data’s unique “engineer-to-engineer” approach ensures the solution you end up purchasing is tailored to meet your needs, says William Huang, president of Area Data Systems.

“We’re not just here to move parts,” he says. “Customers can approach us at any time. We’ll help identify the problem,



then architect and design a system, put it on paper, and conduct a proof of performance test in our robust research and development lab.”

Buyers can be given remote access to the test lab setup, where they may conduct testing with the guidance of Area Data’s engineering staff. Area Data Systems engineers can help install, configure, and tune the tailored system either remotely or onsite, depending on the customer’s level of expertise.

“Clients trust Area Data Systems to provide ultra-scalable, cloud- and big data-optimized storage solutions; robust feature sets; and expert support,” Huang says.

Best Of Breed

Storage setups designed by Area Data Systems are based on products from tier one manufacturers such as the OS-agnostic

storage enclosures from DataON Storage. They utilize the Nexenta unified storage management platform, which is based on the framework of the ZFS OpenStorage technology and can work on industry-standard hardware.

“An OpenStorage platform such as the NexentaStor unified storage solution is ideal for the exponential storage growth challenges found in the cloud and big data markets and can be implemented by SMB companies looking forward toward growth,” Huang says. “And Nexenta is based on a file system that was created in the past decade instead of when Bill Clinton was president.”

Overcoming Roadblocks

NexentaStor offers unlimited scalability and file sizes, eliminating the typical roadblocks enterprises encounter with storage growth and system expansion. In-line data deduplication and native compression greatly reduce the use of primary storage, conserving valuable storage space. Hybrid storage pools take advantage of the I/O cache to accelerate read and write performance, while thin provisioning lets your hosts virtually see a larger storage pool than is physically available. That storage pool can be filled when you need it, without the need to reformat the file system.

With NexentaStor, you benefit from unlimited customized, automated, and periodic

snapshots, unlike with many legacy solutions that limit you to 255 snapshots. Plus, it supports all major virtualized infrastructures.

When you work with Area Data Systems, you are furnished with an end-to-end certified solution you can trust won’t have hardware/software compatibility issues and will help dramatically reduce your storage expenses, rather than consume your entire IT budget. In fact, by using industry-standard hardware rather than proprietary legacy vendor components, you’ll eliminate vendor lock-in and typically save between 50 and 70%, Huang says.

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FEATURED PRODUCT

Cooling That's Effective, Affordable & Energy-Saving

Evaporative Cooling Completely Eliminates Need For Compressor-Based Systems

ONE OF THE BIG NAMES in server manufacturing recently released a new generation of servers that will work very well under the new ASHRAE TC 9.9 guidelines for data center design and operation.

This new generation of servers can handle temperature extremes of up to 45 degrees Celsius, or 113 degrees Fahrenheit, for up to 90 hours per year. One of the rationales behind marketing the server at those conditions was to allow fresh air cooling in virtually the entire continental United States. Other research has indicated that the servers can

operate 87% of the year in Washington, D.C., using fresh air cooling alone.

Energy-Saving Potential

The energy-saving potential of raising the inlet temperatures that high can be enormous. Instead of running chillers or compressors 8,760 hours a year, they are only operating 1,138 hours per year.

It's difficult to put that into numbers, but here's a little example:

If the server power consumption is 300 watts, then the cooling system must

remove 300 watts times 8,760 hours per year or 2,628kWh of heat (8,961,480 BTU). That can be accomplished using mechanical cooling, fresh air cooling, or a combination of the two.

A pretty efficient compressorized HVAC system will remove about 4.5 watts of heat per watt of electrical energy used. So to cool the new server using mechanical cooling will require 2,628,000 watts of heat divided by 4.5, or 584kWh of compressor power.

To cool that same server using fresh air for 87% of the year will only require 75.8 kWh of compressor power. Of course, the fan energy stays the same in both cases, but the compressor savings of 508.2kWh per server can really start to add up.

At an aggressive electric rate of 4.5 cents per kWh, that amounts to \$22.87 per server per year. At modest densities of, say, 40 servers per rack, the savings amounts to \$915 per rack per year. Now consider how many racks are in the typical server room or data center. If the data center has a server load of 1mW, then a density of 40, 300-watt servers per rack will translate into 83 racks. So the annual savings would be almost \$76,000 in this example.

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To make the savings even greater, you could use the Aztec ASC indirect evaporative cooling system. Using the Aztec system completely eliminates the compressor-based cooling, adding another \$3.50 per server per year of savings. That would add another \$11,620 per year in savings for a total annual savings of \$87,620 in this example.

Of course each climate and data center is different, and Aztec analyzes each case. But the reduction in operating costs are significant in every case that Aztec has studied.

Aztec and its sister company, Alton, have been in the evaporative cooling business for 66 years. Many of the evaporative cooling technologies that are just now being introduced to the market were developed more than 20 years ago by Aztec. Our experience, combined with our state-of-the-art controls, can assure you of the most efficient evaporative cooling solution available. 



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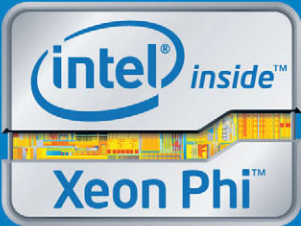


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RM417 / RM418



RM417 Rear view



RM418 Rear view

Features: RM417

- Front and rear Hot-swap HDD/SSD access
- Modular 2.5", 3.5" HDD cages, and middle fans M/B tray
- 6Gb/s mini-SAS backplanes with Expander and SES2 support

Features: RM418

- Rear access 2-bay 2.5" Hot-swap HDD/SSD cage
- Modular 2.5" and 3.5" HDD cages, and middle fans
- 6Gb/s mini-SAS backplanes with Expander and SES2 support

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Unique Features

- Modular Design
- All Receptacles Monitored
- Power Factor per Outlet
- kW Hour Meter per Outlet
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- Reliable PCB Power Distribution
- Fail Functional Design

Metered Outlet - MRP

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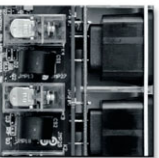
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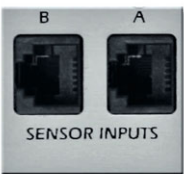
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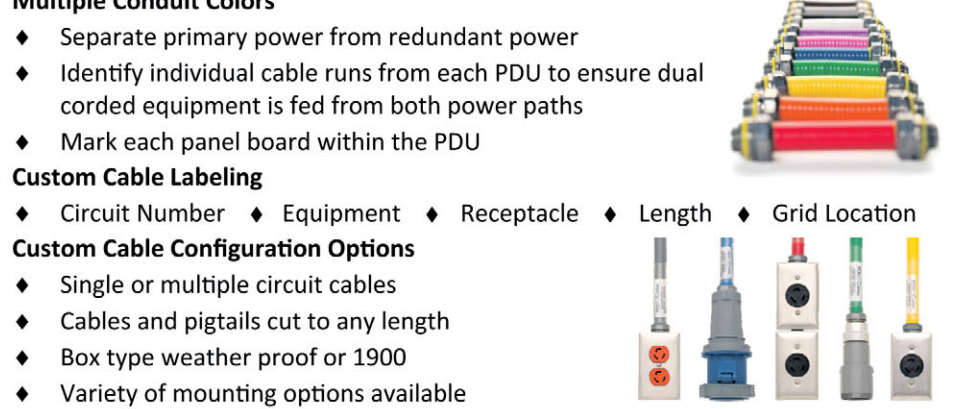
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Environmental monitoring isn't new to IT and data center managers; in fact, most companies have purchased at least one, if not multiple solutions designed to warn you if the temperature or other conditions inside a rack are nearing a specified threshold. But these solutions vary widely in terms of price, size and feature set, which can make it difficult to make changes to your overall system or cause you to lose focus on environmental monitoring altogether.

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AVTECH has been working diligently over the past 25 years to not only make improvements to its own products but help drive the entire industry forward and set new standards. With the Room Alert 3E, AVTECH has packed 30 years of experience and technological know-how into a smaller and more affordable solution that's full of new features designed to maximize downtime and give you a heads-up before a small issue becomes a potentially larger problem.

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With a footprint of about six square inches and a weight of two ounces, the AVTECH Room Alert 3E takes up much less physical space than most other environmental monitoring solutions. And it does so without dipping on critical features. With such a small footprint, you can focus on where environmental monitoring is needed the most and quickly and easily implement a Room Alert 3E.

“AVTECH's Maintenance, Support & Update Service (MSUS) program provides our customers with unlimited technical support; download access for firmware-software-MIBs, which typically includes two to four updates a year; and provides our 100% replacement guarantee for the Room Alert monitor.”

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The Room Alert 3E is flexible both in terms of size and feature-set. You can choose to purchase one device for a single site, implement one or more devices into an existing system, or build an entirely new environmental monitoring infrastructure complete with in-depth management software. AVTECH backs up its products with world-class customer support, which is free of charge for the first year and can be renewed on annual basis for a small fee.

“AVTECH's Maintenance, Support & Update Service (MSUS) program provides our customers with unlimited technical support; download access for firmware-software-software, which typically includes two to four updates a year; and provides our 100% replacement guarantee for the Room Alert monitor,” Signerney says.

In many cases, Signerney says, the cost of an MSUS plan comes down to pennies a day and even less per unit if they purchase multiple Room Alert 3E devices. It's just another sign of AVTECH's commitment to its customers, which now number more than 150,000 in 150 countries. “We're proud of our MSUS program and appreciate every single customer we've had the privilege to earn,” he adds.

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Mobile Devices Reshape The Way Consumers Engage

Mobile devices have moved beyond their role as a way to facilitate person-to-person communication and are now a way for consumers to engage with content and services on the device and beyond, according to Juniper Research. And 2013 will continue to see big changes in the mobile industry.

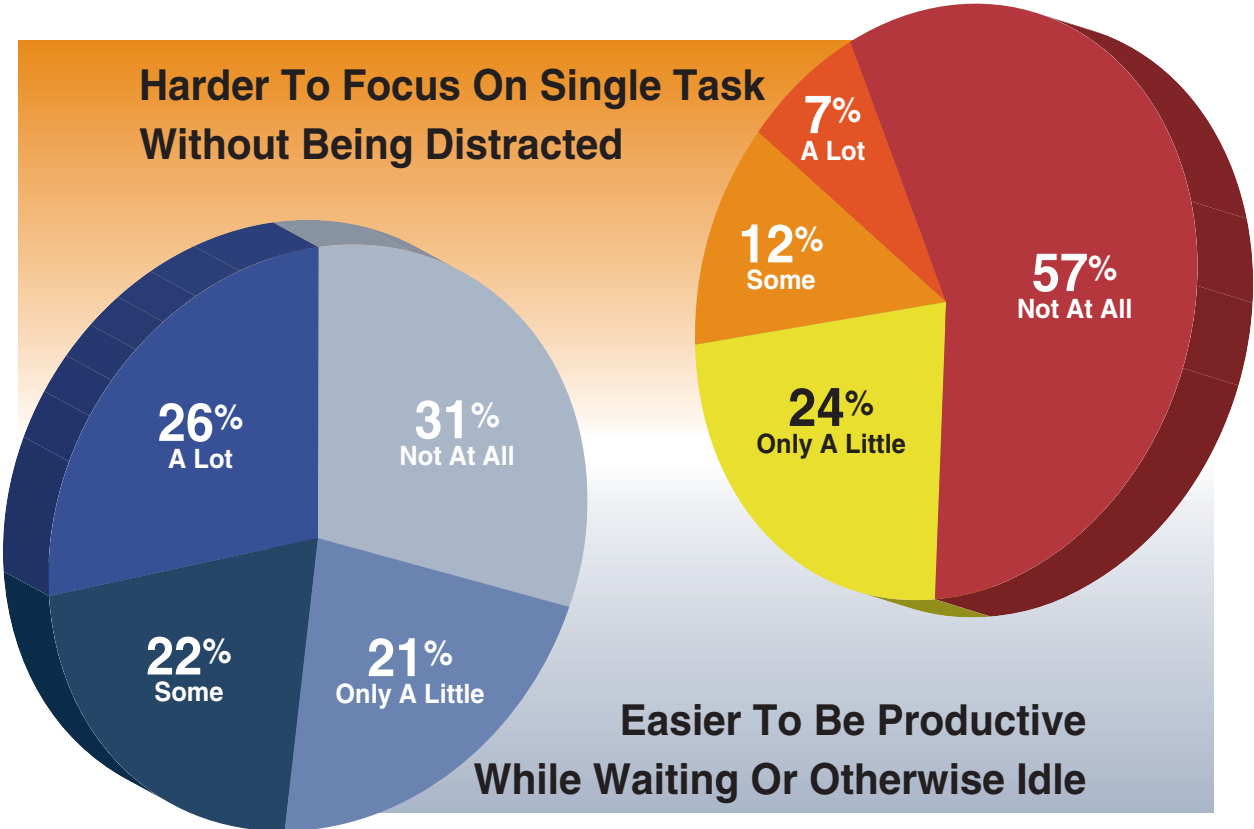


Here are Juniper’s 10 predictions for the mobile industry in 2013:

- **Big data becomes big business.** Expect a growth in consumer data usage and greater demand for analytics solutions.
- **Smart glasses and other wearables.** Several leading manufacturers will launch wearable devices next year.
- **BYOD on the rise; security issues escalate.** Organizations will need to reassess their mobile device and security policies.
- **Retail to embrace the in-store mobile strategy.** 2013 will see more deployments of Wi-Fi hotspots by leading retailers as one way to better interact with customers.
- **Operators to adopt seamless Wi-Fi and LTE connectivity.** This will make a big push to deliver a consistent Wi-Fi-LTE roaming experience.
- **Mobile becomes the connectivity hub.** Objects around our houses and businesses will communicate with each other, with the mobile device acting as a control hub.
- **The year of Microsoft.** The company will exploit its full potential as traditional computing becomes increasingly mobile.
- **The multiscreen, seamless user experience becomes a reality.** Content and applications will become common and synchronized across both fixed and mobile devices.
- **New mobile and tablet form factors to emerge.** Differentiation will become a key determining factor.
- **Social gaming is on the rise.** There could be a substantial market for an established social media brand willing to offer products.

Our Love-Hate (But Mostly Love) Relationship With Mobile Phones

Without a doubt, cellular wireless technology has profoundly impacted the way we work and stay in touch with colleagues, family, and friends. A recent report from the Pew Research Center’s Internet & American Life Project sheds light on the pros and cons associated with our mobile phone usage. Of those cell phone owners surveyed, 65% found it “a lot” easier to stay in touch with people they cared about, 28% found it “a lot” easier to plan and schedule daily routines, and only 9% reported it is “a lot” more difficult to disconnect from work life. However, 24% don’t like how their phones make them constantly reachable. Here are some other salient findings.



Mobile Phone Sales Down

Worldwide mobile phone sales were down 3.1% year-over-year during the third quarter, according to Gartner. Smartphones continued to dominate the market, accounting for 39.6% of all mobile phone sales, with unit sales up 46.9% year-over-year. Although this is the second consecutive quarter of decline in mobile phone sales, Gartner reports that there are positive signs, particularly in China, where sales of mobile phones were up, and in mature markets, driven by sales of replacement phones. Gartner notes that the fourth quarter typically has an uptick with the holidays and year-end, but this year the research firm predicts a lower-than-usual boost from the holiday season.

Department Of Energy Pushes For Battery Advancements

Five Department of Energy national laboratories, five universities, and four private firms are combining their research and development resources in an effort to make substantial improvements in battery performance. The groups will form a batteries and energy storage hub known as the Joint Center for Energy Storage Research; it will be based at the Argonne National Laboratory in Illinois. “Based on the tremendous advances that have been made in the past few years, there are very good reasons to believe that advanced battery technologies can and will play an increasingly valuable role in strengthening America’s energy and economic security,” says U.S. Secretary of Energy Steven Chu. The goal of the group will be to develop a new energy storage concept that overcomes current manufacturing limitations.

Researchers: Mobile Browsers Don’t Meet Security Guidelines

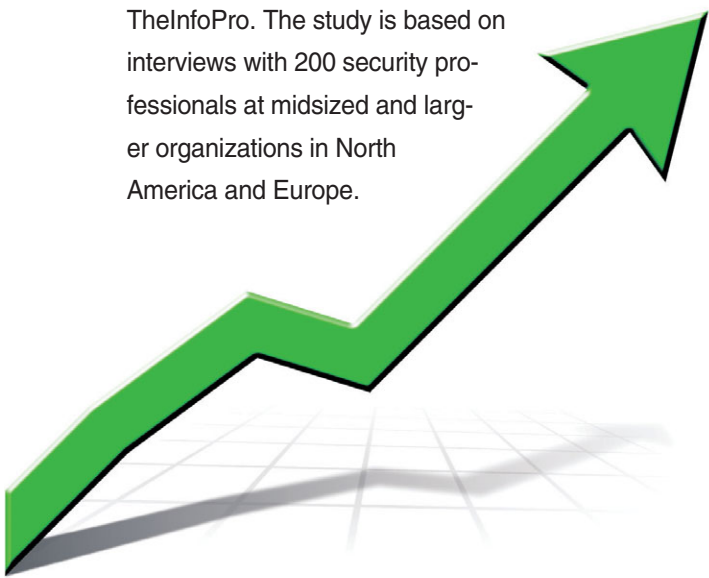
Even cybersecurity experts can’t always tell if their smartphone browsers are accessing a potentially dangerous Web site. That’s the major finding of research conducted by Georgia Tech’s School of Computer Science. In the study, all of the leading mobile browsers failed to meet the security guidelines established by the Worldwide Web Consortium for incorporating a graphical SSL (Secure Sockets Layer) or TLS (Transport Layer Security) indicator in a browser address field to indicate whether a site is safe. These typically take the form of a lock icon or https at the beginning of a URL. Chaitrali Amrutkar, a Ph.D. student in the School of Computer Science and principal author of the paper, says that mobile browsers are three times more likely to access phishing sites than users of desktop browsers. “Is that all due to the lack of these SSL indicators? Probably not, but giving these tools a consistent and complete presence in mobile browsers would definitely help,” Amrutkar says.

Time Spent On Social Media: 121 Billion Minutes

According to the latest “Social Media Report” from Nielsen and NM Incite, U.S. Internet users spent 121 billion minutes on social media in July. That’s a 37% increase over the previous year, as users spent 88 billion minutes on social media in July 2011. Facebook remains the top social media destination, followed by Blogger, Twitter, Wordpress, LinkedIn, and Pinterest. The report indicates that U.S. consumers spend 20% of their online PC time and 30% of their online mobile device time browsing social media Web sites.

Security Budgets Will Be Strong In 2013

2012 was a good year for enterprise security, with about 45% of companies increasing their security budgets compared to 2011, according to a recent study by TheInfoPro. And 2013 could be just as good, with 47% of respondents saying they expect their security budgets to increase and just 8% expecting a decrease. Top security-related projects include mobile device management, data leak prevention, and application-aware firewalls, according to TheInfoPro. The study is based on interviews with 200 security professionals at mid-sized and larger organizations in North America and Europe.

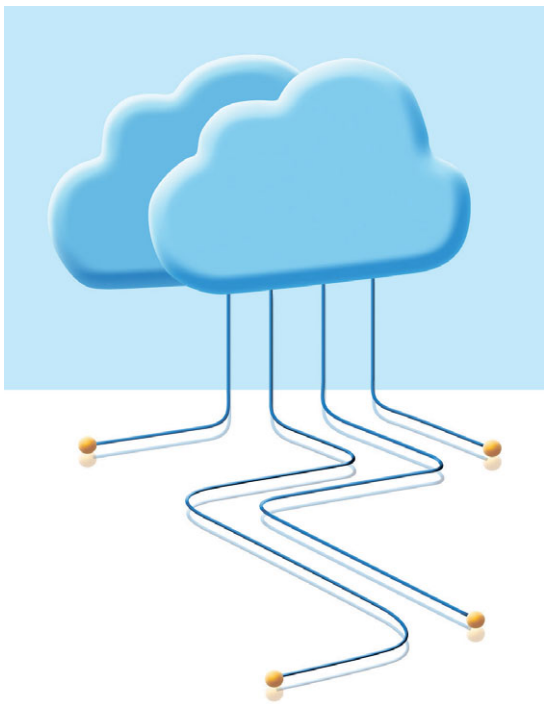


IT Spending Should Be Up Next Year

Provided the United States and Europe avoid fiscal crises, enterprise IT spending will be up about 2.5% in 2013, according to research firm Gartner. “Most enterprises have already significantly cut discretionary IT spending growth over the past several years and, barring a global economic catastrophe and significant contraction of operations, they have little room to reduce IT spending further over the long run,” says Kenneth Brant, research director at Gartner. Through 2016, Gartner reports, three industry segments will offer the biggest potential for growth: banking and securities; communications, media, and services; and manufacturing. Gartner’s predictions for the government sector are less rosy, though, with researchers anticipating IT spending to be down 0.4% in 2013.

Cloud Services To Become “Everyday” Sourcing Option

When it comes to cloud services, there’s a changing mindset among CIOs and line-of-business managers, IDC reports. Changes in cloud services and better user understanding of the benefits mean hosted private cloud will become the enterprise preference for cloud deployments by 2015, says Chris Morris, a lead analyst for IDC. Cost and security are two major factors contributing to the shift. By 2015, IDC reports, cloud will be just another common delivery model within new commercial terms for supply of business and IT services, forming the basis of what IDC has coined the “Outsourcing 3.0” period.



Study Examines Fraud Rings, Interconnections

The United States is home to more than 10,000 fraud rings, or groups of people who are actively collaborating to commit identity fraud, according to a study by ID Analytics. The study looked at more than a billion applications for bank cards, wireless services, and retail credit cards. The report found that wireless carriers experienced the most fraudulent activity, with Georgia and South Carolina serving as the biggest hotbeds of activity in all three industries studied. ID Analytics found that fraud rings most commonly consist of two or more career criminals. However, ID Analytics reports that a large number of families are also working together in fraud rings as are groups of friends.

won’t be making direct person-to-person payments en masse but will use mobile ecommerce services to the tune of \$1 trillion-plus in worldwide purchase volume by 2017. Mobile ecommerce seems to be where it’s at because it is becoming an established, easy to use method for buying goods and dovetails with continued uptake in smartphone and tablet sales. By contrast, person-to-person mobile sales are hindered by a lack of common standards and limited means for adding and withdrawing funds, IDC says.

“Soft” Server Market Means Revenues Decline

After a strong server refresh cycle in 2010 and most of 2011, year-over-year revenue from sales of servers was down 4% worldwide during the third quarter. This marks the fourth consecutive quarter of revenue declines. IDC group vice president Matt Eastwood cites a number of reasons for the continued decline, including technology transitions and poor macro-economic conditions in many areas of the world. Eastwood notes that every geographic region except the Asia-Pacific had a decline in revenue from server sales. Server unit shipments were up slightly during the third quarter; server shipments have been up 11 of the past 12 quarters. Microsoft Windows servers represent 51.1% of the market, Linux takes 21.5%, and Unix accounts for 17.3%.

Tech Execs Expect IT Hiring To Increase

A recent poll of more than 1,400 CIOs from companies throughout the United States found that 17% expect to expand their IT departments during the first quarter of next year, 8% expect cutbacks, and 75% plan to keep staffing levels the same. The study, conducted by Robert Half Technology, shows that 63% of CIOs say it’s getting increasingly difficult to find skilled professionals—up nine points from the previous quarter. IT security, application development, and data/database management professionals are the most challenging to find. About 50% of respondents say their firms will be investing in IT projects during the first quarter, with 87% somewhat or very confident in their companies’ prospects for growth during the quarter.

Mobile Ecommerce Boom Forthcoming

In its “Technology Selection: Worldwide Mobile Payments 2012-2017 Forecast,” research firm IDC asserts that in the coming five years consumers



SIX QUICK TIPS

Improve The Security Of Virtualized Environments

Take Time To Know The Threats & Analyze Your Weaknesses

FOR REASONS RELATED TO cost-cutting, utilization, consolidation, and more, virtualization is undeniably on the rise. Any number of current surveys and studies conducted of enterprises of all sizes can confirm as much. Even those companies that haven't shifted at least some of their physical servers to a virtualized environment are planning to. Most companies today, including small and midsize ones, view the move to virtualization as not just a possibility but as an absolute necessity.

One recent survey notes that among companies that are planning to adopt virtualization, those with fewer than 100 employees rank the highest. Despite all the benefits that virtualization can bring companies, however, there are unique concerns that IT and data center managers should

take into account (but sometimes overlook) before actually carrying out an implementation. These include addressing specific security concerns associated with virtualization. The following provides information and advice detailing some of these concerns and how to tackle them.

✓ *Don't Be In A Rush*

One of the biggest security-related issues that moving to a virtualized environment poses for many companies simply has to do with IT's general familiarity with virtualization. "Virtualized environments may be more attractive to hackers not because they are inherently insecure, but because they require a different approach to security than traditional physical environments—an approach with which most

organizations have limited experience," says Amy DeCarlo, Current Analysis principal analyst, security and data center services. Small and midsize enterprises in particular, she says, generally tend to have limited security expertise on hand to begin with, and "in their haste to deploy virtualization, security may be an afterthought. This leaves a potentially easy opening for hackers to exploit."

Due to this lack of experience, there's a good possibility that data center and IT managers won't be adequately aware of the potential security issues that a virtualized environment can even create. Another factor for this, DeCarlo says, is that breaches to virtualized environments haven't been widely publicized to date. Also, she says, "I think IT is under such pressure to deploy

virtualization that security moves down the priority list."

✓ *Know The Threats*

Among the unique security threats and/or vulnerabilities that a virtualized environment creates, DeCarlo says at a high level, the lack of visibility and the dynamic nature of virtualization creates an environment that's "much more challenging to monitor and secure." For small to midsize enterprises specifically, DeCarlo counts available resources (or the lack of security expertise) as being the most significant issue, as "that lack of knowledge and potentially limited investment in adequate security technology has the potential to put the SME's virtualized environment in harm's way."





Charles King, principal analyst at Pund-IT, says that because many security solutions are hardware-centric (or mapped to specific physical servers/systems), they “don’t provide adequate protection for virtual machines/applications, especially if those workloads are being actively migrated.”

Adding to the complexity of virtualized environments and impacting their overall system performance, he says, is the creation of virtual firewalls and similar solutions. “That said, probably the biggest issue has to do with misalignment between the groups that manage IT and those who manage security, which are typically separate,” King says. Because of this arrangement, IT isn’t always aware of the issues that “should cause them the greatest concern, and security pros aren’t

always provided the information they need to work effectively.”

✓ *Start Planning Early*

If enterprises wait to address security after adopting virtualization, they’re too late. “Security cannot be some kind of ad-hoc, post-deployment exercise,” DeCarlo says. No matter the size of the organization, she says, it needs to begin considering security concerns from the early stages of the virtualization planning process. If the organization lacks the expertise in-house to adequately address all the security questions that deploying a virtual environment requires, the company needs to seek out a trusted third party to help provide support during the process, she says.

✓ *Seek Advice From All Corners*

King suggests seeking advice from outside parties. Part of that should entail talks with security vendors about the specific solutions they offer for virtualized environments and for examples of how other customers have implemented their solutions. Further, he suggests that companies make inquiries of various virtualization vendors, as “security is an issue they’re deeply aware of and experienced with, and who knows better what solutions are best for those environments?”

Overall, King says while the core benefits related to virtualization, particularly those centered around consolidating applications and workloads onto far fewer systems, are so “profound and simple to achieve,” he suspects many organizations

plunge into virtualization efforts without much forethought. This is where it can prove fruitful to seek input from security and virtualization vendors that are intricately involved in this area and offer solutions that address and enhance security of virtualized environments.

When contacting vendors, DeCarlo suggests asking the vendor what the security implications of virtualization will be to the company’s particular applications, if virtualization is appropriate for these applications, how the company can maintain an adequate level of control without interfering with performance, how the company can obtain visibility into its virtual environment, what the compliance implications will be for the company, and how the vendor can effectively meet those specifications. **P**

✓ *Budget For Tools & Training*

One of the key positives associated with virtualization is the possibility that adopting a virtualized environment can save the company money. One theory, however, is that to implement a sound and secure virtualized environment, the company has to spend money upfront to acquire the various tools and training that’s necessary. If the company can’t budget for these assets, the theory is it should bypass adoption until it can do virtualization properly.

✓ *Conduct A Self-Examination*

In order to address the virtualization-related security concerns that SMEs are likely to deal with, first and foremost, IT and data center managers must know where the company’s weaknesses reside, says Pund-IT principal analyst Charles King. “Without that understanding, it’s far easier to make what can be severely damaging mistakes,” he says. After identifying weaknesses, King suggests consulting with trusted security and virtualization vendors to assess the company’s situation, determine if that situation is adequate, and, “if not, determine how best to address the problems.”

BONUS TIPS:

✓ *Size Doesn’t Matter*

Small to midsized enterprises can no longer get away with thinking they’re not enticing targets for hackers. Small to midsized enterprises “face virtually all the same security issues and problems as large enterprises,” says Charles King, principal analyst at Pund-IT. Typically, however, smaller enterprises don’t have the budgets or expertise to deal with those issues and problems effectively, he says. As a result, they can be more attractive targets for hackers. “It’s a bit like being the smallest member of a herd—you live life with a target painted on your back.”

✓ *Face The Facts*

In terms of the kind of target that virtualized environments pose for hackers, King says, “I wouldn’t say virtualization makes any IT environment potentially more or less attractive. In fact, you could argue that as virtualization has become pervasive over the past decade, that dealing with it is simply a fact of life for both the businesses and those who wish to exploit them.”

Understand Network Traffic & Pinpoint Performance Issues

Monitoring Solutions & User Feedback Can Help

WITH THE INCREASING SPEED and performance demands of applications, employees, and end users, enterprise networks are more burdened than ever before. The constant flow of traffic can result in data bottlenecks, performance issues, or, worse, complete outages.

It can be difficult for IT managers to keep track of the network traffic or even fully understand why problems are occurring. That's why it takes a layered approach of speaking to employees and end users, implementing network monitoring systems, and using data to make informed decisions. It could be that your network issues require nothing more than a simple software or policy adjustment, or you may find your network is due for an overhaul. But either way, it's more

important than ever to have improved visibility and hone in on problem areas in your network.

Be Aware Of Network Performance Issues

One of the fastest and easiest ways to discover problems on your network doesn't require you to use software or any other type of solution at all. Your employees and end users will certainly let you know if they are experiencing performance issues, which will be your first sign that there may be a significant problem. "If performance is slow or you're dropping a lot of packets, from the end user perspective, those are the things they'll call the help desk about," says Mark Tauschek, lead research analyst at Info-Tech Research Group.

Key Points

- Speak to employees to determine what types of network performance issues they are experiencing. This can include not being able to access an application, noticing latency issues when Web browsing, and other common problems.
- Use a network management system to monitor your network. Not only do these solutions give you a better overall view of your network, but they also help you proactively avoid performance issues.
- If your network regularly suffers from the same issues, it may be time for an upgrade. There are many ways to plan ahead to help you avoid running into similar issues in the future.

Tauschek says that many employees will complain about not being able to open an application or that voice calls are choppy or jittery. However, there may also be a situation where it's one specific user or a group of users that is overburdening the network at one time. For example, Tauschek says, "We know that every day at 12:30 everybody jumps on Facebook and YouTube and starts killing our network," or, "Mark over there is downloading a big file and



it’s consuming all of our 10 megabits.” These are common network issues that could be temporary nuisances or long-term problems. And in many cases, there’s only one way to monitor the traffic to determine whether the issue requires serious attention.

Implement A Network Management System

For data centers, the constant movement of data on the network requires something more than a simple status indicator that says whether the network is up and running. Network management systems not only give you an overview of your network as a whole, but they also let you dig beneath the layers to pinpoint where exactly the performance issue is.

Tauschek recommends that companies look for a network management system that “gives you some visibility into the performance, traffic patterns, and problem areas of your network.” Because networks are often complex, you have to constantly monitor them or you could end up rushing to react. “There’s an inclination to sort of say, ‘Put it in, it works, leave it alone, and forget about it,’” Tauschek says. “You don’t care about it until it doesn’t work, and then you really care about it. If you’re proactively monitoring your network, then you are in a much better position to be proactive.”


For companies that are just starting out, Tauschek says that there are lower-end, relatively inexpensive solutions that give some view into the health, behavior, and performance of your network. The key is

to put some sort of monitoring solution in place because it will not only help you spot problems that need your immediate attention, but it could also help you determine whether your network requires more extensive changes.

Know When It’s Time To Upgrade

If you’ve gathered testimonies from your employees and end users, implemented a network management system, and determined that your network simply can’t keep up with even regular usage, it may be time to add more capacity or completely overhaul your network. “There are many ways to optimize bandwidth usage, such as application of WAN optimization or other technologies, but they don’t help the data center network,” says Jonah Kowall, Gartner research director.

Kowall adds that networks are under quite a bit of pressure because of private cloud implementations, virtualization, and other projects. For those reasons, data centers may have no choice but to upgrade their networks to meet demand and handle the large amount of traffic.

“Most organizations today are running some level of 10Gb Ethernet, but many are investing in 40Gb or looking at 100Gb in the coming years,” Kowall says. “Monitoring the network and bandwidth can allow for capacity planning, but doing the proper type of monitoring and planning is the only way to really plan for an upgrade. Replacing the core network is very costly, so the move toward 10 and then off to 40 or 100 is something that should not be taken lightly.” 

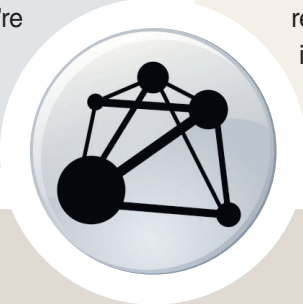
Top Tips

The following tips were provided by Mark Tauschek, lead research analyst at Info-Tech Research Group:

- ✓ Through the normal course of usage, when you hit 80% network capacity, you better start thinking about adding capacity or refreshing your network. And when you hit 90%, you should be in a position where it shouldn’t go much beyond that. If you’re pushing 95% or hitting 100%, then you’re going to have significant performance problems.
- ✓ Make use of the thresholds and alarms within your network management system. When you hit a threshold from one type of flow, user, switch, or port or whenever you hit a threshold that is indicative of misuse of the network or a problem in the network, you are alerted to it so you can come in and investigate it before it becomes a problem for users.
- ✓ Understand the linkages between the network that is in your control, the server infrastructure, and the public Internet that is perhaps outside your control, depending on how you’re structured. If you’re a pure network guy, you need to have some visibility into the end-to-end performance.

Action Plan

- If you don’t already have a network management system, consider investing in one that will give you a more in-depth view of the traffic and alert you to potential issues before they become major problems.
- Determine where network issues originate, whether it’s at the software and application level or if it’s a hardware-based problem.
- Figure out the best course of action to resolve network issues. You may find that the network struggles during peak hours and requires additional capacity, or you may discover that one user or department is taxing the network, which could lead to policy changes.
- Make sure to keep your monitoring solutions up to date and check your network status on a regular basis. If you spot emerging performance issues early on, it’ll be easier to address them and make the necessary changes.



Get Started

Implementing a network management system is a great place to start becoming more familiar with your network and its performance. Jonah Kowall, research director at Gartner, says that companies need to be able to monitor three data sources. The first data source is the network device, which is normally monitored via SNMP; the second is flow, which is generated by the network device and is a summarized data source of more detailed usage of the network; and the third data source is comprised of packets or raw data that is traversing your network, Kowall says. Monitoring packets is the best way to monitor your applications from a network perspective. Kowall recommends that companies use application-aware network performance management (AA-NPM) solutions because they provide “a deeper amount of visibility into application performance,” which can help you determine whether your network issues are happening at the application level.

Plan A Server Refresh

Use New Servers To Implement More Efficient & Effective Features

IF THERE’S ONE THING in the data center that requires significant attention, it’s your servers. A drop in performance creates a domino effect that can be felt by anyone within the company and even by customers outside of the organization.

For every data center, there comes a time when a server refresh is needed to beef up capabilities, increase energy efficiency, and ensure that your company will always be up and running to serve customers. We’ll show you a few things to keep in mind when going through a server refresh that should help you save money while still getting the performance and features you need.

✓ Look At Upgrading Components First

You may assume that a server refresh requires an overhaul, but it’s possible to simply swap out components, such as hard drives or network devices, to give your servers that extra boost. “Provided a customer sticks with industry-standard chassis and rack solutions, swapping out components or systems for higher-efficiency models are the most cost-effective paths to hardware upgrades,” says Don Clegg, vice president of marketing and business development at Supermicro (408/503-8000; www.supermicro.com). “Depending on supplier and processor roadmaps, a refresh can

start at the component level upgrading HDDs to SSDs or installing faster memory and higher bandwidth interconnectivity options.”

Clegg also points out that you can upgrade the BIOS on a motherboard or upgrade your CPU and other components. It’s possible to keep your existing racks and overall infrastructure setup without completely starting from scratch. And you can refresh over time rather than all at once, letting you spread out the costs associated with server upgrades.

✓ An Opportunity For New Technology

Buying new energy-efficient servers gives you the option of upgrading the

base features of your server. You can invest in not only the features you’ll need now, but the features you’ll need as your company continues to grow. Two such features, which often go hand and hand, are consolidation and virtualization. You may be able to replace two or three older servers with a single new unit, which can free up additional space for other pieces of equipment or increase the overall airflow of your data center. And you can implement server virtualization, which can lower your costs for individual computing platforms for employees.

“Virtualization has become a mainstream practice, and it can be used to assist consolidation by allowing multiple application workloads to share the same





physical servers,” says Jenna Maertz, research analyst at Info-Tech Research Group. “A combination of server consolidation and virtualization can save between 40 and 75% of upfront and ongoing hardware costs, making a server refresh significantly more affordable.”

✓ *Beware The Hidden Costs Of Old Equipment*

You may be tempted to hold on to your older servers for as long as possible. But there’s a downside. “As a general rule, servers should be replaced every four to five years,” Maertz says. “Keeping aging equipment longer than this timeframe puts you at risk for actually spending more than if you just replaced the servers in the first

place. You may save on the initial capital investment, but there are hidden costs to keeping old equipment.”

Some of these hidden costs include additional hardware investments, such as replacement parts, system adjustments, and add-ons, Maertz says. She also says that installing and running newer applications on older hardware can lead to major compatibility issues and the need for expensive server upgrades in a short amount of time. And servers that have been used extensively for a longer period of time are more prone to breakdowns.


Server upgrades are also a good time to take a different approach by better integrating new servers during a refresh, Maertz says. “Stop taking a silo approach to server

deployment and start thinking more holistically,” she says. “Your server infrastructure is like a puzzle. There is one overall picture, and you need to put the pieces together to make it all fit. You have X overall requirements and X total capacity; now, figure out how the pieces fit by dividing your applications across your available servers, using multiple applications on each physical server. Be sure to take into account both current and future capacity for your application workloads.”

✓ *Plan Ahead For Installation*

Once you’ve decided on which servers to purchase and have them ordered, the work is far from done. Charles Jansen, technical support manager at Aberdeen

LLC (800/500-9526; www.aberdeeninc.com), says you need to schedule downtime to complete the upgrade, determine how long the server will be down—“It can take 24 to 72 hours just to build a new RAID group using 1TB/2TB/3TB drives,” Jansen says—and make sure personnel will be available during that timeframe. Also ensure that vendor support will be available, and gather and review device-related documentation to limit surprises, he says.

Jansen also suggests checking the server’s warranty status and whether it can be extended; double-checking and documenting specifications for the current BIOS, firmware, drivers, and internal components; and gathering server and component serial numbers in case support is required. 

✓ *Become More Energy-Efficient*

Implementing a server refresh provides a great opportunity to be more efficient environmentally and in terms of energy consumption. Older servers will often draw more power than newer, more efficient alternatives, so it may be more cost-effective to buy brand new servers as opposed to trying to maintain your existing ones. Improved energy efficiency can also lead to savings elsewhere. It will reduce the need for constant maintenance and repair, which can free up your IT team’s time for other projects. And it can also make your other systems more efficient.

“Energy consumption for data center cooling is rising,” says Don Clegg, vice president of marketing and business development at Supermicro (408/503-8000; www.supermicro.com). “The only way to curb this runaway cost and be more environmentally friendly is to transition to energy-efficient servers that operate at higher ambient temperatures and reduce dependency on air conditioning.”

✓ *Communicate With Your Vendor*

When going through a server refresh, you should be in constant contact with your vendor to not only ensure you are getting the features you need, but to request additional services that may be provided for free. “A helpful tip is to ask vendors to help with capacity planning,” says Jenna Maertz, research analyst at Info-Tech Research Group. “Many vendors will try to win your business by offering free workload modeling services and tools, which can help you determine the capacity requirements for both your virtual and non-virtual workloads. This can help ensure that you get the maximum capacity out of each of your servers.”

BONUS TIPS:

✓ *Map Out Your Goals*

Mapping out short- and long-terms goals and strategies is vital to a successful server upgrade. Mark Bowker, Enterprise Strategy Group senior analyst, says that because server upgrades often align with new IT projects, applications, or application upgrades, it’s important that “IT focus on both the life cycle of the application and how it aligns with the expected life of the server and account for planned and unplanned scale.” IT should also know its options. Too often, Bowker says, IT purchases a server with more capacity than needed, which provides the comfort of extra headroom but adds expense. “IT should understand what the latest processor chipset is on the market and what the stated roadmap of the chip manufacturers are,” he says. “This will help avoid buying into servers that are at the end of a product lifecycle.”

✓ *Upgrade Your Racks & Chassis*

If you don’t already have standardized racks or enclosures for mounting multiple equipment modules, then a server refresh is a great time to make that change. “Look for server solutions with designs incorporating sliding rails and tool-less chassis access for easy maintenance and access to hot-swap hard drives, power supplies, fans, and other components that may need replacing,” says Don Clegg, vice president of marketing and business development at Supermicro (408/503-8000; www.supermicro.com).

Organize & Clean Your Center

Keep Your Data Center Clear Of Messes, Obstructions & Other Issues

THERE’S PLENTY OF OPPORTUNITY for disorganization in a data center. After all, it can be a source of lots of activity, with equipment (and even people) regularly being added or moved. Whether it’s something as simple as moving a few cables around for better management or something as complex as changing the entire layout of your data center, there are many ways to improve organization and prevent messes or potential outages related to an inefficient design. We’ll walk through a few examples designed to help you get your data center on the right track and prevent future organizational issues.

Develop A Master Floor Plan

The best place to get started with data center organization is to look at your data center layout, discover potential

issues, and then build a master floor plan that will clear up those issues. “This plan identifies the ultimate location of all equipment in the room at full build-out,” says Lars Strong, senior engineer at Upsite Technologies (888/982-7800; www.upsite.com). “Historically, room layout decisions were made primarily on aesthetics or legacy layout. Now, layout and organization decisions need to be based on the following criteria: reliability, functionality, efficiency, and, lastly, aesthetics.” To help create a solid master floor plan, Strong recommends that companies think about hot and cold aisle containment when designing their floor plans to make sure airflow is moving efficiently. A master floor plan and the correct configuration of equipment, cooling systems, and other

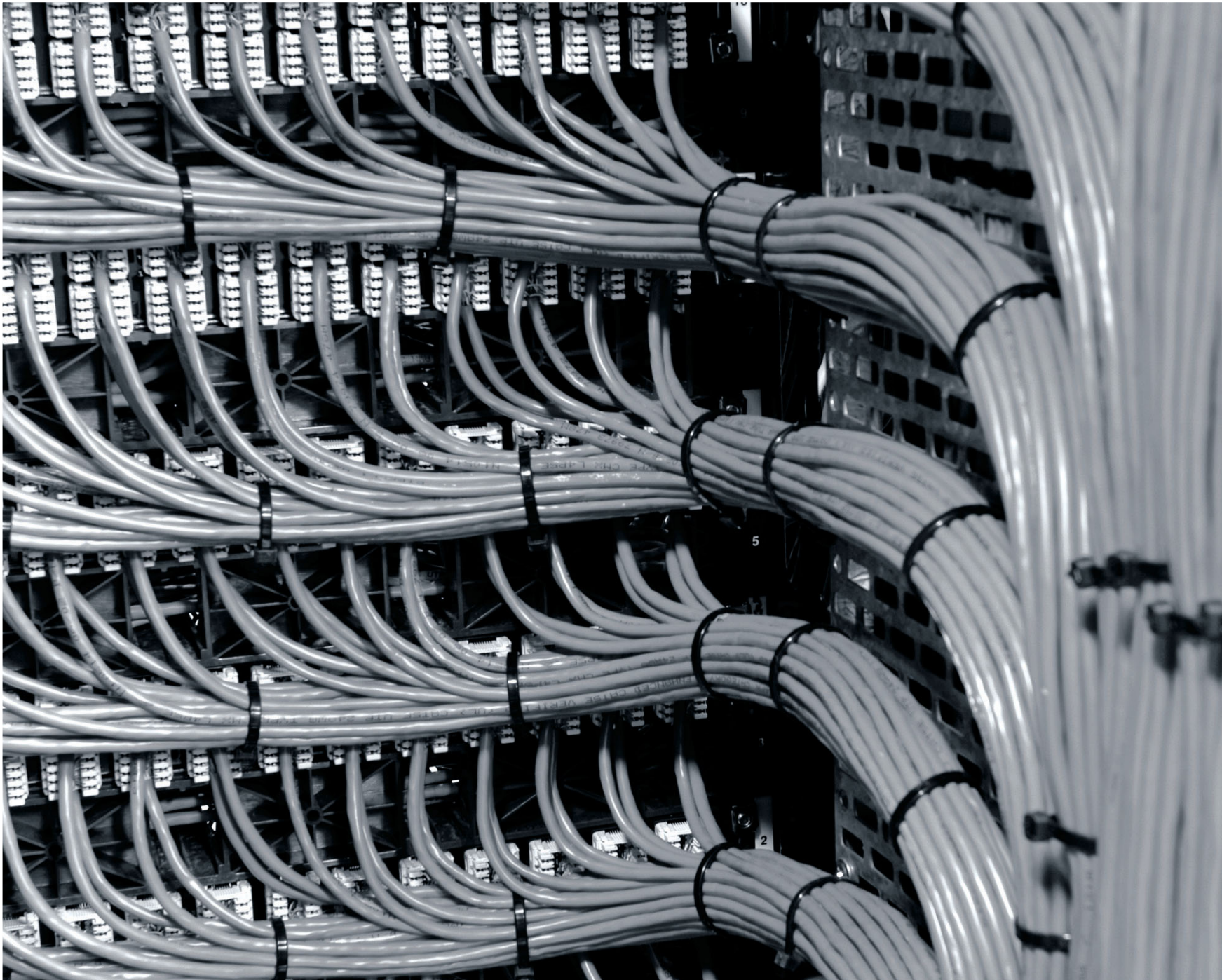
solutions will result in a nicer looking data center and leave enough room for employees to move around.

Improve Cable Management

Whether you’re trying to cleverly route cables from one end of the data center to another or simply trying to manage the patch cables used in and between racks, effective cable management is one way to avoid disorganization in the data center. “When trying to organize a messy data center, the first step is to determine what style cabling topology you have or desire and then select the appropriate equipment to support it,” says Laura Viars, senior sourcing specialist at Rackmount Solutions (800/352-6631; www.rackmountsolutions.net). For instance, Viars says that if you have a “distributed, in-cabinet switching

Key Points

- Create a data center master floor plan that helps with the layout and configuration of your equipment. This can also help with other organizational issues such as cable management.
- Plan ahead during data center moves or layout changes to ensure that everything goes smoothly and you avoid the messes that often accompany large-scale redesigns.
- When your IT team makes changes to data center equipment, make sure they have adequate time to prepare and implement. Rushed installations can lead to disorganization in the data center layout and inside the racks.



topology” you will need to focus on “cable tray and exhaustive internal cable management for your switch cabinets.” The best approach depends on your specific layout and environment.

For some companies, physical cable management simply isn’t enough. This is a time where you may want to consider implementing new cable management practices or even software solutions that can aid in the cable routing process. Darin Stahl, lead research analyst at Info-Tech Research Group, says, “Even if I have as little as 500 endpoints, I can look at cable and asset management software tools that are graphical and allow me to do labeling and track all of my changes.” There are many cable management solutions available, but some of them can be extraordinarily expensive, according to Stahl. He

recommends doing your research and finding the solution that fits your network size.

Plan Ahead During Moves & Redesigns

If you are updating the layout of your data center or moving from one location to another, make sure you put a well-formed plan in place. There are few times when you get the chance to start from square one and redesign a data center, so take advantage of it. This is an opportunity to learn from your current experience and decide if your current configuration is the best fit for your needs and employees. And it’s also an opportunity to look for possible organizational issues, head them off at the pass, and put your data center in a much better position for the future.


“Leave nothing up to chance,” Viars says. “Conduct extensive research or

consult a data center planning professional if you are at all unsure of what will best suit your needs. If possible, plan for a redundant solution to keep your network running so that you aren’t tempted to rush a rebuild in order to get back online more quickly. If you’ve done your homework and take your time, your move or redesign will go much more smoothly.”

Focus On Change Processes To Prevent Future Messes

You can improve your overall data center organization by adjusting your business processes and how you handle implementations and changes. “We’ve actually seen a trend where [IT] teams, because they are so pushed to get things done and be agile, are actually shortcutting some steps,” Stahl says. “They’re just trying to

shrink delivery times. But what happens when you start removing these steps in well-established change processes is that over time it’ll tend to cause clutter and disorganization, which beyond just being messy, can lead to unplanned outages.”

To help avoid disorganization due to rushed implementation, Stahl says that companies should “commit or recommit to strict change policies” and focus heavily on the consequences from not giving your IT team enough time to make changes. He recommends companies track metrics and “use past and real experience” to make improvements in the change process. This will not only ensure that the job itself is done right, but also prevent inefficient equipment configurations, cable management mishaps, and other potential issues. 

Top Tips

Laura Viars, senior sourcing specialist at Rackmount Solutions (800/352-6631; www.rackmountsolutions.net), offers the following tips for improving the organization of your data center:

- ✓ **Research your topology.** You’ll want to make sure you are using one that works best for your needs. Don’t forget to factor scalability, manageability, and growth into your plan for reorganization.
- ✓ **Plan your new layout.** Even if you’re just reorganizing or modifying your layout, get a firm plan in place and procure the equipment needed to execute it.
- ✓ **Plan your time.** Determine the timeframe required to make the modifications—and be generous. Determine how much downtime you’ll have and prepare accordingly. The more planning you can do upfront, the better off your data center move or reorganization will be.

Action Plan

If you’re ready to get your data center organized and cleaned, follow these steps provided by Darin Stahl, lead research analyst at Info-Tech Research Group:

- Think about your racks, cabling, decommissioned devices that haven’t been removed from the racks, testing, and tools. Clean up those things and reorganize those racks. Also take the time to update the topology and rack diagrams.
- Focus on the patches and patch panels. These are quite often areas where infrastructure changes result in a mess as people are in a hurry.
- Move on to set up rooms and staging areas. A good spring cleaning here and there, reorganizing that space will ease all of your deployment activities. Get the boxes out, re-label, and get rid of the equipment you no longer need.
- Look at your utility spaces that really deal with the infrastructure facilities such as standby power rooms. The human traffic in that room isn’t always your staff. It’s often maintenance techs, who are usually pretty neat, but over time bits of wire or discarded work order forms start to pile up. It’s amazing what you’ll find in there.

Get Started

When you’re thinking about reorganizing your data center and planning for a potential new layout, it’s important to consider the human element. “You really want to step back and take into account all of the needs of your data center employees,” says Darin Stahl, lead research analyst at Info-Tech Research Group. “They’re going to be working in that room, and they need space to move around. They need space to access equipment and also a workplace to do staging and deployment.” Organization will not only make your data center look better, it can also help employees be more productive by creating a more natural flow throughout the space.



Make The Transition From IPv4 To IPv6

Know Where To Start & The Challenges You'll Face To Ensure Success

THE INTERNET HAS A PROBLEM in that the roughly 4.3 billion unique Internet addresses that IPv4 makes available globally are expected to run completely dry by 2014. Enter IPv6 and the 340 trillion trillion unique addresses it provides, along with other improvements over IPv4.

IPv6 officially launched on what was dubbed World IPv6 Launch Day with reportedly 3,000 Web sites, five home router manufacturers, and 65 network operators making the leap. In coming years, enterprises must also make the transition. The following details where to start and how to proceed.

Transition In Steps

A transition to IPv6 consists of numerous parts, says Eric Hanselman, research director at 451 Research. The urgency of

each part depends on the enterprise, he says. Enterprises that run all their own IT might consider moving some operations to a service provider to minimize the transition's complexity, he says. Further, any new network equipment and services investments should address IPv6 capabilities and performance, he says. "While software upgrades may be able to add IPv6 functionality to older networking gear, throughput may not be at the same level as IPv4, making hardware upgrades more attractive."

Mike Sapien, principal analyst at Ovum, says transitioning to IPv6 is "definitely a multi-year project" that IT staff should address to ensure Internet communications can support IPv4 and IPv6.

Network infrastructure providing Internet communications needs modified or

reconfigured to enable Internet traffic with both protocols, he says. "This will require new IP addressing and validating that the existing equipment can be upgraded to support IPv6 or be replaced."

Start With A Plan

Sapien advises starting with a network assessment to get an inventory and accurate view of those Internet resources needing modification or configuration. In many cases, preparing for this transition requires an investment in equipment. Enterprises must take stock of the equipment in their data centers and network closets and determine whether it is possible to use it in an IPv6 environment. Concerns about equipment upgrade costs and the available IPv6 talent pool may drive organizations to adopt IPv6 in a phased approach, bringing

Key Points

- The transition to IPv6 from IPv4 may entail numerous steps executed over multiple years.
- Involve network, application, media, and financial teams in transition planning.
- Performing a network assessment is a good beginning point in order to obtain an inventory and accurate view of Internet resources that may need modified or configured.

parts of the network online as equipment comes due for routine replacement.

Once you've conducted an audit of your hardware, applications, and vendors, creating an IPv6 transition plan with a testing phase built-in; working with network equipment



and service providers; testing specific network architecture, services, and equipment; and implementation should follow.

“It’s not something that happens immediately, inside of a week,” says Richard Jimmerson, director of deployment and operationalization at Internet Society. “There’s actually a lot of planning involved to determine what is going to be best for your company, what methods to use, the timing. You may discover a year down the road that you’re too late—this is something you had to do yesterday.”

Jimmerson adds that an important part of your action plan is determining which services need to be capable of dual-stacking, meaning they can accommodate both IPv4 and IPv6 traffic. He says that Web services and email, for example, will need to be dual-stacked for some time.

Involve The Right Parties

Beyond network teams, Hanselman says it’s critical to involve application and media teams in the transition effort. “Getting full functionality of IPv6 requires that the applications running over the network are also IPv6-ready. Although it has always been a poor design, some applications embed IPv4 literal addresses (rather than fully qualified names) in Web sites and media content,” he says. “In most cases, this will break access to those applications.”

Sapient advises that the IT department act as project lead but says the transition will impact all enterprise areas. “Since this will involve some capital or equipment purchases, the financial department has to be kept in the loop

to fund any hardware, software, or services required for the transition,” he says. Overall, view the transition as a corporate-wide program that will affect internal and external communication.

Prepare For Challenges

The biggest challenge enterprises face in transitioning to IPv6 is that the implications are not well understood by most organizations, Hanselman says.

“To start, a new level of complexity is added to a company’s DNS presence. DNS is the foundation of Internet reachability between an enterprise and its customers, and complexity adds risk. IPv4 and IPv6 namespaces have to be managed and monitored,” he says. Another issue is that some enterprise networks may be running IPv6 and not realize it. By default, he says,

“Windows 7 has IPv6 enabled and unless explicitly blocked, may be allowed to tunnel through firewalls to the Internet. It’s already being used as a way to bypass filters for Internet access because of this.”

Just building a business case to fund the transition can be challenging, Sapient says. Other hurdles can relate to validating and testing network equipment, servers, and applications to ensure the work; identifying and including third-party resources and partners to include in planning; ensuring e-commerce and customer portals can support new devices and mobile access types that require IPv6; and reviewing and verifying security methods with IPv6. “It may not be a problem, but IPv6 may enhance security or circumvent IPv4 security measures, so it has to be addressed,” Sapient says.

Top Tips

- ✓ **Start with the customer.** Eric Hanselman, research director at 451 Research, advises enterprises start an IPv6 transition with customer-facing resources. Mobile devices currently are heavy users of IPv6, he says. Eventually, more devices will have access to native IPv6 connections and Web sites, and externally available applications can perform better and could offer richer services to the users behind those devices.
- ✓ **Keep other benefits in mind.** Mike Sapient, principal analyst at Ovum, says the benefits of transitioning to IPv6 include:
 - Support for devices and customers using IPv6 and ensuring internal and external communication is available when partners and customers turn on IPv6
 - Long-term global reach
 - Access to the multiple Web site/Internet resources most companies depend on
 - The ability to maintain communication as mobility in and out of the enterprise grows
- ✓ **Consider an IP address management system.** Hanselman says you should consider an IP address management system to aid in an IPv6 transition. “These have been a good choice for decreasing operational complexity with IPv4 and are of greater value with IPv6,” he says. Additionally, he says, “IPv6 gateway functionality in load balancers or delivered from content delivery networks can be a simple way to make the transition to IPv6 without the need to modify existing Web sites and applications.”

Action Plan

- Bring together required parties (network, application, media, financial, and so on) for planning.
- Perform an assessment of the network to surmise what may need modified.
- Create a transition plan that includes a testing phase.
- Determine the necessary hardware- and software-related costs.
- Involve network equipment and service providers in planning and implementation.
- Test the network, services, and equipment to make certain IPv6 equipment and services work as billed.



Get Started

Experts say that those companies that have planned ahead will likely be the most successful with the transition to IPv6. “They will have people, either out of necessity or out of preference, who are going to be trying to reach their Web site or their mail services using IPv6, and you want to plan out in front of that and make sure it’s taken care of well in advance,” says Richard Jimmerson, director of deployment and operationalization at Internet Society.

Mike Sapient, principal analyst at Ovum, says, “I liken it to having a disaster recovery plan. I think that every enterprise should have some planning for it in place so that when the time comes that they need to do it, they have a well thought-out plan to make the transition.”

SIX QUICK TIPS

Move A Data Center

Avoid Management Headaches & Ensure A Successful Relocation

MOVING A DATA CENTER can be a stressful process. Not only do you have to manage a large-scale shift of equipment and software to a new location, you also have to make sure you aren't impacting the productivity of employees at your current facility. And once everything arrives at the location, the installation and implementation of solutions is a seemingly insurmountable task in its own right.

Fortunately, you can take some steps to ease the pressure of moving your data center by stressing the importance of planning, seeking help when needed, and upgrading your systems whenever necessary to ensure your new data center performs even better than your previous one.

✓ *Plan, Plan, Plan*

For the data center move to go as smoothly as possible, it's important to set up an in-depth plan that takes every possible facet of the move into consideration.

"A data center relocation can be best described as a controlled disaster that involves high risk and requires a minute-to-minute plan for execution," says Melanie Davy, senior research analyst for Info-Tech Research Group. "Organizations should start by assessing upgrade opportunities to de-clutter the move. Upgraded or refreshed equipment can be installed directly in the new facility shortly before the move—instead of taking it with you—and decrease the risk of moving certain equipment."

Davy says that one of the most important parts of the data center relocation plan is the order in which certain systems will be moved and installed. For instance, she points out failure of a phone system could result in loss of productivity and business and is therefore extremely risky to move. You could choose to upgrade your telephone system by installing it at the new data center site right away, which would provide enough time for proper testing. Davy also recommends putting hardware and software pieces into bundles, which are components that must be moved together. This will ensure that once something is installed, it can be used almost immediately.

But even before you move in a single piece of hardware, you should do a walkthrough of the new data center space to make sure it's ready for installation. "Conduct your due diligence for the data center facility with an inspection before the move day," Davy says. "Once the facility has been cleared, pre-staging of upgraded systems can begin, such as racks, network gear, power cabling, etc. Constant communication with the facilities team will ensure that, come move day, there are no surprises."

✓ *Consider Hiring A Moving Company*

You may have the urge to perform the data center relocation yourself in order to save money, but this could end up causing





you to cut corners and have an ultimately unsuccessful move. There are many data center moving companies in the industry that are specially trained in data center relocation and have vast experience with the process. Data center moving companies can help during planning and aid you all the way through the relocation process with helpful management-related advice. They can also utilize your internal IT team to make sure your company is kept in the loop throughout the move. For most businesses, experts say, it's a good idea to invest in a moving company upfront instead of paying for potential mistakes later on.

"If you don't want to supervise every step yourself, an experienced data center moving company can provide vendor management

and control the migration environment to maintain your budget and schedule," says Deborah Petty, president of Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). "By considering your needs and defining the project scope in advance, an experienced data center moving company can ensure that there will be no unexpected costs associated with the move."


✓ *Avoid Running Up Your Moving Expenses*

Despite all the planning and preparation, budgeting can be a tricky area, especially during the move itself. That's why Davy says it's so important to include every budget item up front. You have to account for potential one-time costs that may occur

during the relocation process and be prepared for potential future costs if your data center move is being done in installments. It's important not to lose track of any aspect of the moving budget, or you could end up spending more money than you originally anticipated.

However, once the budget is written down and finalized, that doesn't necessarily mean it should be set in stone. You must be adaptable to issues that may arise during the move. "Revisit the budget often," Davy says. "After the initial budget has been determined, be sure to revisit it throughout the term of the project and get sign-off on any changes. It is better to make changes to the budget throughout the project than to come out over budget in the end."

✓ *Lay Down A Future-Proof Foundation*

Moving your data center should be looked at as an opportunity to start over. You don't necessarily have to overhaul your entire business approach, but you can make a few small- or large-scale changes that can improve your data center and put it in a much better position for future use. "Organizations should look for upgrade opportunities when planning a move," Davy says. "Data center relocation provides an opportunity to leave behind sins of the past. Follow best practices on data center design for cooling, cabling, and placement of equipment, as well as virtualization, to save space in the new data center." 

✓ *Round Up The Troops*

One of the most important parts of moving a data center, yet one that's easy to get lost in the shuffle, is ensuring that every employee or contractor involved in the move understands their part and is ready to contribute. If the employees and/or the moving company aren't working as a team, then the move will not go as smoothly as planned.

"Continuously monitor and evaluate the mission-critical relocation," says Deborah Petty, president of Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). "Make sure you define roles and responsibilities to eliminate confusion on move day and maintain efficiency to keep costs down. If you are using a moving company, make sure your staff and their POC understand everyone's exact duties and what they are responsible for."

✓ *Establish A Relationship With The Moving Company*

If you do decide to take advantage of a data center moving company's services, then you should make sure the company is reputable and will clearly lay out everything you're paying for.

"Request statements of work from all vendors under consideration to get an idea of vendor expectations, requirements, and pricing," says Melanie Davy, senior research analyst for Info-Tech Research Group. "Ask for references from recent clients with projects of similar scope and magnitude to verify the vendor's claims. The median cost of third-party service providers was over \$6,500/rack, accounting for 45% of the cost of the move, according to a recent Info-Tech survey."

BONUS TIPS:

✓ *Map Out The Necessary Connections*

"Make sure you have all technical documentation and connection mapping, detailing all connections, power requirements, and IP addresses, so everything goes back exactly as before, unless you are using this opportunity to redo or revise your systems," says Deborah Petty, president of Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

✓ *Avoid Downtime Through Preparation*

"If parts of your operation need to stay up and running during the move, coordinate ongoing business in phased moves, reducing the impact on your business and employee productivity," Petty says.

Find Specialty Racks & Cabinets

Know What To Look For & Where To Look When You Have Unique Needs

NOT ALL DATA CENTERS are created the same. Some, for example, operate under unique conditions that require special equipment, including specialty racks and/or cabinets that feature seismic, noise-reducing, air-conditioning, cable-management, moisture-resistant, filtering, and other characteristics that go above and beyond the normal enclosure. Here’s an overview of what options are available in terms of specialty racks and cabinets and how IT/data center managers can go about identifying those situations and environments that might justify purchasing them.

Spot The Signs

Although standard racks and cabinets will serve most data centers needs, there are instances where enterprises need to combat

factors related to heat, dirt and debris, noise, shocks, and other conditions. Additionally, there are situations in which companies need to address configuration issues related to space, cabling, security, and more. In fact, says Laura Viars, senior sourcing specialist at Rackmount Solutions (800/352-6631; www.rackmountsolutions.net), there are any number of situations that can arise that might require a data center to need a specialty rack or cabinet vs. simply using a standard, run-of-the-mill unit.

One example, she says, is that certain topologies call for IT to drop extremely large bundles of cable into one rack or cabinet. Sometimes, these cable bundles can be so large that a standard cabinet cannot accommodate them, she says. In other cases, Viars says, managers might call

upon specialty cabinets to solve a unique data center issue, such as providing efficient cooling and power in an environment that doesn’t have raised flooring or one that operates under space constraints.

Know What Is Available

Although specialty racks and cabinets are available in all kinds of shapes and sizes, several types have emerged as being the most popular. Among these are network cable management racks. “These racks and cabinets are specially designed to accommodate applications with higher-density cabling than usual,” Viars says. Such racks feature additional space for handling cable bundles built into the sides of the rack, she says, which creates an overall wider rack that still maintains

Key Points

- Numerous situations can cause an enterprise to consider using a specialty rack or cabinet, including unique cabling needs, thermal management, and the need for noise reduction.
- Cabinets and racks featuring network cable management, power distribution, and water cooling characteristics are among the most popular types of specialty racks and cabinets.
- Consulting a knowledgeable sales representative is arguably the best place for companies to begin in determining if a specialty rack or cabinet is necessary.



standard 19- or 23-inch rack mounting. Enterprises can purchase these with cable management built-in or according to the company’s own preferences. “These racks are especially beneficial for switch applications where you might have bulk cabling coming off of the front of the rack and routed toward a single side,” she says.

Another popular choice is power distribution enclosures, which are designed to provide companies enhanced flexibility where providing power to equipment is concerned. “A common issue that can occur when providing power down a row of cabinets the traditional way is that it requires a large quantity of seal-tight cables to be run under the raised flooring to the cabinets,” Viars says. “Not only are these cables expensive, but in the larger quantities, they also restrict

airflow underneath the floor, reducing the overall effectiveness of your cooling.” In addition to providing a neater system that makes maintenance easier and less expensive, using a power distribution enclosure can also “be the way to go if your data center doesn’t have raised flooring,” Viars says. “This solution will significantly reduce the number of cables that would need to be run in overhead cable trays.”

A third popular type of specialty enclosure features water cooling. Viars says one of the biggest obstacles that data centers face is providing efficient and sufficient cooling. “Even in the most well thought-out layouts, data center managers still have to address issues caused by hot air recirculation and uneven cooling,” she says. “This can be especially troublesome when trying

to integrate new equipment.” A water-cooled enclosure featuring a closed-loop system can aid in such environments by removing heat that servers and other equipment generate via the use of chilled water. Such enclosures are “ideal in situations where you are trying to integrate a high-density cabinet into your layout or if you have issues keeping a particular cabinet cool with your current solutions,” Viars says. Additionally, data centers that lack the ability to provide underfloor cooling systems can also benefit from the use of water-cooled enclosures, she says, as they eliminate the need for plenum cooling.

Plan Carefully

For enterprises still in the planning phases of designing a layout for new data

center space, Viars says reviewing the topology will help determine if a specialty cabinet or rack is required.

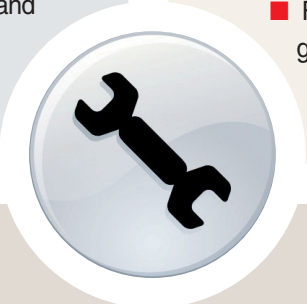
She adds that in the early phases, asking questions such as if the company foresees having excessive cable bundles in particular areas and if a neater, more efficient, large-scale power solution is being considered “will help you accommodate your data center for ease of management and future growth.” If the company is attempting to improve on its current data center setup or has a particular area of concern (insufficient cooling, cable clutter, etc.), “these issues can often be determined by how well your equipment is operating, how easy it is for you or your staff to troubleshoot issues, or a visual assessment,” she says. **P**

Top Tips

- ✓ **Don’t skip security.** For enterprises that experience a considerable amount of traffic passing through their data centers, including by visitors from outside the company, a specialty enclosure that features a locked cage or other integrated, security-minded features can be appropriate.
- ✓ **Look at thermal control options.** One possibility for data centers in need of thermal management is interchangeable doors that provide thermal-control abilities built in. Options include those that IT can order as a new rack and those that fit over existing racks in a retrofit fashion.
- ✓ **Go vertical.** Many data centers find themselves faced with the dilemma of needing to add equipment to their data center operations but lacking the actual data center space to accommodate more equipment. For such situations, there are racks and cabinets available that are deeper and also provide the ability for IT to expand upward, offering the means to use existing space in a more efficient manner.

Action Plan

- Assess your current data center situation in terms of physical and configuration traits.
- Review the various topologies that might be at play.
- Note any concern areas, including security, heat, and cabling.
- Speak with a sales representative about your specific layout and needs.
- Factor in future data center growth, equipment additions, and other factors.



Get Started

The best starting point for an enterprise to determine if a specialty rack and/or cabinet is necessary is to speak with a sales representative who is well-versed in this area. “They’ll be able to assess your current situation and determine whether a specialty cabinet might be something you’ll want to consider,” says Laura Viars, senior sourcing specialist at Rackmount Solutions (800/352-6631; www.rackmountsolutions.net).

Because there are numerous factors involved in determining what equipment will work best for any particular application, she says, “receiving some professional advice will certainly help.” She suggests having a layout of the enterprise’s current setup available for the sales representative to review, which will aid in pinpointing the ideal solution. Because many specialty cabinets are built to order, she says, “you’ll want to make sure that any measurements that have been taken are accurate and that you’ve provided your sales representative with any and all information that might be relative to the project.”

SIX QUICK TIPS

Minimize & Prepare For Data Recovery Failures

Plan Well To Protect Your Company From Data Loss & Downtime

FOR A DATA CENTER, data loss can either be a minor inconvenience or a large-scale catastrophe. That's why it's important to have backup solutions and a data recovery system in place. You may think you're fully protected by simply having these solutions in your data center, but what if one or more of them were to fail? In order to avoid a worst-case scenario, you need to have a plan ready to go, monitor your recovery solutions at all times, and know what you'll do if you need someone to manually recover your data.

✓ *Develop A Rock-Solid Data Recovery Plan*

When it comes to data recovery, your chances of success or failure begin and

end with the plan you put in place. You have to come to terms with the fact that a server may go offline, a power surge may put your facility in a standstill, or someone might wipe a hard drive by accident. You need to know how your systems are being backed up, how to access your backed-up data when you need it, and how to avoid downtime through preparation. But in addition to having a data recovery plan, you should also make sure you know how your IT employees will respond to and rectify a data loss event.

"The first critical step is to build the right disaster recovery team," says Victoria Moore, research analyst at

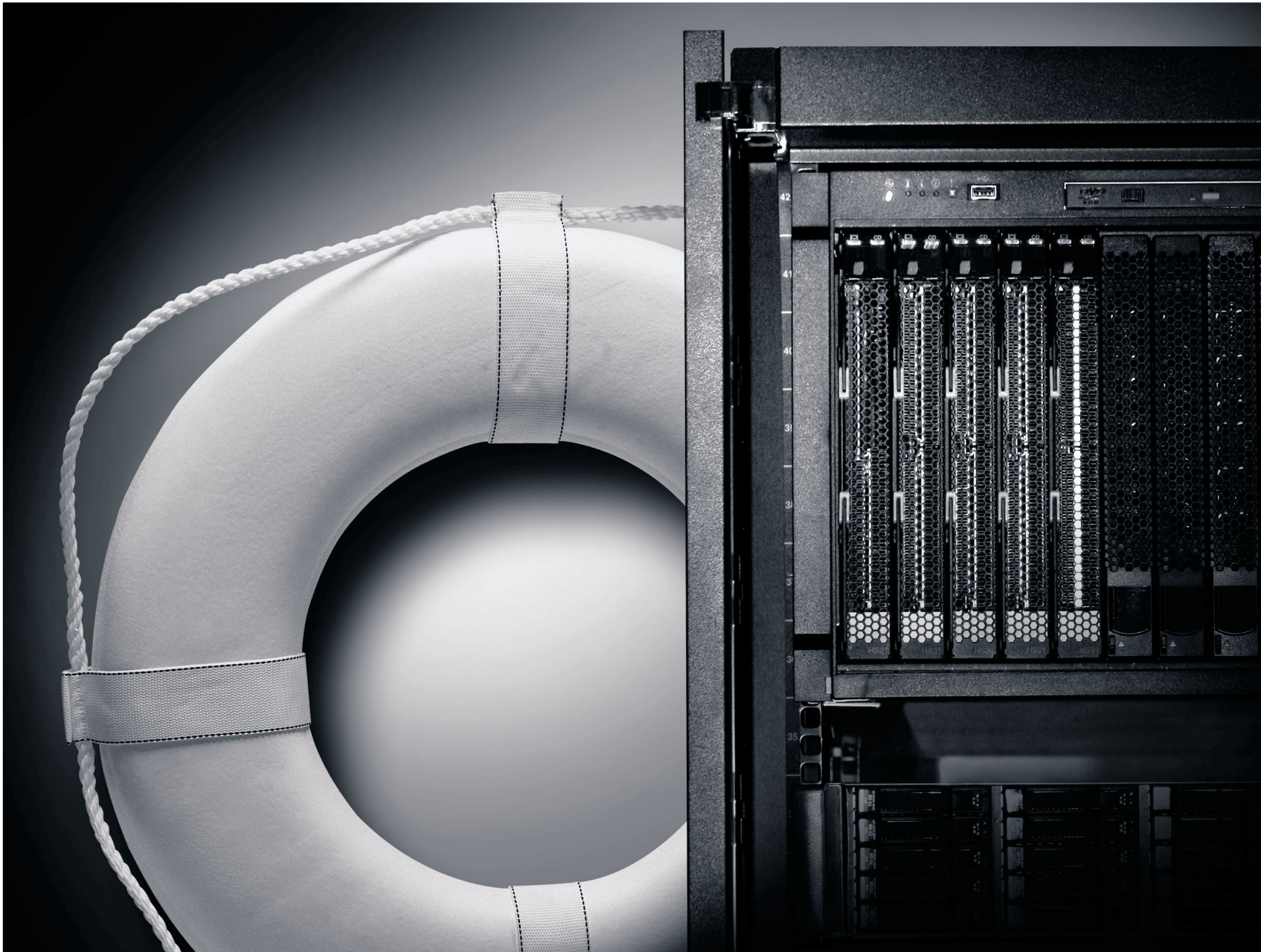
Info-Tech Research Group. "This isn't necessarily about finding the right people; the real stress is on ensuring the right duties are being fulfilled. It's about having the right roles and responsibilities and ensuring everyone knows what actions have been assigned to them. When designing the disaster recovery plan, set objective and clear trigger points. Don't allow reactions to rest on an individual's subjective opinion when you are risking the organization's safety."

✓ *Test Your Data Recovery Plan & Solutions*

Once you have your data recovery plan in place, you'll need to run through it,

says Roberta Witty, research vice president at Gartner. "A plan on paper is worthless," she says. "You have to actually go through the steps of executing that plan, which means that people are moving to the recovery data center, bringing up new hardware, loading up new software and applications, restoring the data from whatever backup media you're using, and then having the end user log on and try to access the application. There is no other way unless you actually have a disaster, and then it's trial by fire, which is the absolute worst time to do this."

From there, you need to determine whether this plan will meet your RTO, or recovery time objective, which is the



maximum allowable downtime—how long a system can be out of service without really hurting the business, Witty says. She recommends that companies look for “pain points,” which will help determine whether an item should be added to the disaster recovery plan. Pain points can be easily discovered either before testing begins or during the testing process, which is much more effective than attempting to remedy them after the fact.

You’ll also need to test your recovery solutions. For instance, you may opt for physical backup on tapes or hard drives, but you may also want to institute virtual alternatives. However, you can’t just set these solutions and forget them. As with any

other system in the data center, you need to regularly test them to make sure they are performing at the highest possible level.

✓ *Consider Using The Cloud*

Moore says a tiered approach to data backup and recovery is important, but some companies may benefit from cloud more than full offsite recovery. “If the company is large enough, an offsite facility might be warranted, but for many organizations, backing up to the cloud is an economical alternative to funding their own offsite facility,” she says.

There’s a lot to gain from backing data up to the cloud, including benefits tied to redundancy and reducing IT workloads.

But there are also numerous considerations to weigh, including cost, says Jason Buffington, Enterprise Strategy Group data protection analyst. “Cloud backup is not free. A lot of SMBs, when they see the cost of cloud-based backup, get sticker shock.” Enterprises should remember, however, they’re not just gaining storage but management of that storage, he says. “You need to think of value and not price,” he says.

✓ *Have A Data Recovery Expert Lined Up Just In Case*

Despite your best preparations, there’s always a chance you could experience both a data failure and a data recovery systems failure at the same time, which is why you

should consider having a data recovery expert lined up and ready to go.

Buffington says better cloud providers offer the same quality of training and support as on-premises backup providers. Thus, enterprises should have high expectations where experience of deployment, skills, and knowledge building are concerned.

If a disaster occurs, in many situations, companies are simply blindsided by the unexpected and aren’t sure how to react. But if you have a plan, regularly test your data recovery solutions, and have a third-party expert ready, then you have a much better chance of surviving data failure and getting your data back with as little downtime as possible. ⓘ

✓ *Be Prepared To Spend Money (But Don't Overestimate What You Need)*

“While everyone wants to spend pennies to save dollars, real data protection may cost dimes, not pennies—but you’ll still be saving dollars,” says Jason Buffington, data protection analyst with Enterprise Strategy Group. Often, management may underestimate the financial impact downtime or lost data has until it’s too late, he says. “In today’s market, that may mean losing a key client or potentially being unable keep the doors open just because you can’t get your data back.”

Buffington says one obstacle smaller enterprises may encounter is assuming they must match the protection levels of large enterprises. “Don’t overestimate what you need, or sticker-shock will kill you,” he says. “Don’t underestimate, or you won’t be able to recover. Understand what you need, and it will ‘fit’ financially. Just be sure that you have the right tailor so the ‘fit’ is correct.”

✓ *Invest In The Right Hardware & Software*

Be sure to determine which backup solutions are reasonable. For example, a Band-Aid approach that buys the enterprise time until it can modernize data protection for the long haul might be appropriate, says Greg Schulz, Server and StorageIO senior advisory consultant. Schulz advises stepping back from comparing tools and technologies initially and instead reviewing service-level objectives and requirements, including RTO and RPO. “Also, review data access and usage patterns, as well as identify data that is a candidate for archiving from databases, email, and file systems,” Schulz says.

BONUS TIPS:

✓ *Assess & Refine Your Data Recovery Plan*

Victoria Moore, research analyst at Info-Tech Research Group, says that sometimes you can’t fully test your data recovery plan until a data loss event occurs. “Reviewing and refining should occur post testing, and an actual disaster is as complete a DR test as you can get,” she says. “If your organization ever does need to run through their DR plan, a thorough post-mortem should be performed to identify and improve any weak points.”

✓ *Invest In Offsite Data Recovery*

In some situations, onsite data recovery solutions simply aren’t enough for data centers. Similar to how you can set up a colocation agreement to house equipment and infrastructure in an offsite facility, you can also back up your data to a third-party data center.

Use Green Alternatives To Meet Power Demand

Environmentally Friendly Energy Sources Can Lead To Better Energy Efficiency

MANY COMPANIES WANT to make their data centers greener and take strides to improve energy consumption and efficiency. But some companies want to take it one step further and power their data centers using clean, green energy sources. Although this isn't necessarily an option for every company, there are some ways to meet your power demands using green alternatives. We'll show you a few examples of green energy sources, explain their potential uses and benefits, and help you determine whether they're a fit for your company.

Research All Available Energy Sources

The number of alternative energy solutions available may seem overwhelming at

first. The best course of action is to determine what types of power you are interested in and then research them as much as possible to make sure they are truly applicable for your enterprise's needs.

Most companies are familiar with solar, wind, and hydro power, which are commonly used in some industries today. Jenna Maertz, research analyst at InfoTech Research Group, says that solar and wind power are most beneficial to companies that want to complement existing power sources, while hydropower is only an option for those located near dams but can be a "good alternative to coal."

In addition to solar, wind, and hydro power, there are other options, some of which require major changes but can

come with great results. One such alternative is geothermal power. "Data centers can be designed so that the piping systems take advantage of cool underground temperatures in order to provide heat exchange," Maertz says. "This is a good energy source but would require a new build or significant renovation to existing facilities." One other alternative is biogas, which is created when organic matter breaks down and can be used as a natural fuel source. "It comes from sources such as waste, wastewater treatment plants, farms, landfills," Maertz says. "Biogas projects are still mostly in the beta stages, and the energy source hasn't been fully tested, but in the future, this could become a viable source of clean energy."

Key Points

- Research all available alternative energy sources, including solar, hydro, wind, geothermal, and biogas.
- Based on your data center design, location, or future data center building plans, determine which power sources are a fit and will result in short- and long-term benefits.
- Consider investing in new equipment and technologies at the platform and component levels. These investments can not only lead to a more green and efficient data center but also help you save money in the long run.



Decide Which Sources Are A Fit

Although it's a great idea to look at alternative power sources for your data center, they may not all be financially or geographically feasible. And some of them may not provide as much of a benefit as you might think. For instance, Simon Mingay, research vice president at Gartner, points out that solar photovoltaic approaches require "huge areas for solar farms, which make them impractical for most, other than for peak-shaving purposes." He also says that cogeneration or trigeneration using natural gas turbines is sometimes the only option for data centers to make a larger dent in their power consumption. However, it's "difficult to


retrofit in many circumstances, but easier for a new build," Mingay says.

But that doesn't mean that you don't have options for improving your energy efficiency. For instance, you can implement free air cooling or water cooling techniques using natural sources, which can help cut down on the energy needed for running your cooling systems. And if you do want to take the natural gas route with cogeneration or trigeneration, there are ways to raise money for projects and also make them much more manageable. "Funding for onsite generation is easier where power purchase agreements are available in which the capital costs and maintenance are taken on by a third party in return for an agreement to buy

the power at an agreed rate/kW hour," Mingay says. It's important to base your green power approach on your specific needs and location.

Efficiency Improvements At The Platform Level

When you're investigating ways to boost power efficiency, Daryl Lang, vice president of product management at OCZ Technology (www.oczenterprise.com), says you shouldn't overlook improvements you can make at the platform level. Tactics such as deploying more energy-efficient servers or implementing virtualization will help you cut down on the energy necessary to power your equipment, but you can also go down one step further to the component level.

For example, Lang says, enterprises could implement SSDs because they provide better performance than hard drives and can lead to quite a few energy efficiency benefits. "One trend that OCZ has seen with many customers' data centers is to deploy more spinning media capacity than is actually required in order to meet the application performance needs," Lang says. "SSDs can be as much as 100 times faster than HDDs, and this exponential speed increase on a per-unit basis can allow companies to meet their overall application performance needs using fewer racks, fewer controllers, etc. All of this downsizing activity translates directly to power savings, and indirectly to HVAC savings." 

Top Tips

Jenna Maertz, research analyst at Info-Tech Research Group, offers the following tips for improving the energy efficiency of your data center:

- ✓ The recent recession has led to tighter IT budgets and stalled or ended many green IT initiatives. A long-term approach to green IT will lead to cost savings, while those organizations that act reactively see only inconsistent results. If you face organizational resistance to green projects, try recasting them as cost reduction tactics to gain more executive buy-in.
- ✓ Before looking for complicated green IT projects, focus on the simple ways you can decrease your existing power usage. Consolidate servers, power off unused system, and focus on building automation where possible.
- ✓ Take advantage of your geographic location. Look for opportunities to implement free cooling if temperatures throughout the year are low enough. Annual temperatures only need to be below 72 degrees Fahrenheit for you to leverage seasonal or overnight free cooling. Embrace hydropower if you are near a dam, and wind power if there is a local wind farm.

Action Plan

Jenna Maertz, research analyst at Info-Tech Research Group, recommends following these steps when investigating green power alternatives:

- **Define clear environmental goals.** To start with, this can just be the intent to investigate current energy usage, and then using those measurements to set defined and realistic targets.
- **Start measuring energy costs to bolster your business case.** Be sure to emphasize the value to the business to encourage executive buy-in.
- **Encourage a green culture in your organization.** Create an environmental committee with both senior and junior employees. The initiatives should not just be top-down.
- **Look for incentives and rebate programs to fund your initiatives.** State and federal governments are increasingly offering incentives for decreased energy usage, and many organizations fail to take advantage of them. Talk to your local utility company for more information.
- **Incorporate sustainability into your ongoing processes.** Evaluate and report progress to ensure initiatives stay on track and staff remains engaged. As a bonus, green practices also create goodwill with suppliers and consumers.



Get Started

For most companies, instituting a whole new power source simply isn't feasible or cost-effective. That's why Daryl Lang, vice president of product management at OCZ Technology (www.oczenterprise.com), recommends companies look for smaller projects first before moving on to more large-scale undertakings. For instance, companies can use SSDs and virtualization software on servers to dramatically increase the virtual machine density on existing servers, he says. "Because the data access limitations are removed, the same server infrastructure can now run up to 10 times the number of virtual machines, allowing the data center to decrease energy costs in both servers and storage," Lang says.

BUYING TIPS:

Data Center Furniture



FURNITURE IS THE REAL BACKBONE of your data center. That’s why purchasing furniture that matches your needs is essential. Here’s what to keep in mind.

✓ *Know Your Company*

The best place to start is with your company needs. “Some companies need conference room furniture for secure and private consultations, and others, such as network centers, might utilize server cabinets or colocation cabinets and racks,” says Susan Wynne, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net) The furniture you choose depends on the services your company provides.

✓ *Research Available Vendors*

A solid data center furniture vendor will have a long track record of providing high-quality products and services. That ensures you can view it as a partner and work with the company for years to come. “You want a vendor that you can invest in for the future,” says Eli Hertz, CEO and president of Hergo (888/222-7270; www.hergo.com). “You don’t want to deal with a company that will only be around for a one-time purchase.”

Also, be sure to research all of your available options. “Look for a reputable company with knowledgeable sales staff and one with short lead times,” Wynne says. She also recommends spending more money upfront on quality products from a long-standing

vendor. “The initial investment may be more than you wanted to spend, [but] the furniture will stand the test of time.”

✓ *Look For Functionality*

One common mistake buyers of data center furniture make is to put style ahead of functionality, says Earl Stout, vice president of sales and product development at Lanstar (800/474-3947; www.lanstar.com). “You need to select a company that manufactures technical furniture that will fit your application,” he says. “One size does not fit all.”

Stout says the most popular options include: **Adjustable shelves.** These allow for the flexible arrangement of equipment within the rack or framework of the furniture.

Casters. Many furniture manufacturers make their technical furniture with casters so the equipment can be easily moved, freeing up room in small spaces.

Cable management and power. Look for cable management and power that are integrated into the furniture framework.

Locking cabinets. These are popular as added protection for valuable equipment.

Sit-to-stand adjustable workstations. Mechanical or electrical appliances let users change the height of the work surface and the related equipment to the correct ergonomic position for their task.

Rackmount brackets. Many manufacturers have 19-inch rackmount brackets that fit into the slots of the frames. Plus, small

19-inch rackmount cabinets can be integrated into the framework of the furniture.


✓ *Make Sure You Use Your Space Efficiently*

You can save money without sacrificing quality by making sure you are using space efficiently. One way to do this is to go vertical rather than horizontal, possibly by investing in pieces of furniture that are wall-mountable. “Office and lab space is at a premium,” says Kristen Speranza-Diamond, vice president at Hergo. “It’s beneficial to go vertical and make the best use of square footage.”

Speranza-Diamond says that most necessary pieces of furniture and equipment for data centers are becoming less expensive, “so everyone is upgrading and making the transition to go compact.” Manufacturers are putting more advanced technology into smaller packages, which will help you put more equipment into each piece of furniture.

✓ *Focus On The Future*

Be sure to look for key features, such as height-adjustment for chairs or cable management systems for racks. If you invest in modular furniture with swappable pieces, you’ll have room for future growth, Wynne says.

Choose furniture that will have a long lifespan. “You have to know that your current furniture will still be available in six or 12 months should you wish to duplicate or expand,” Wynne says. 

KEY TERMS

Adjustable height.

Refers to components users can raise or lower for a better individual fit. Some higher-end furniture can be adjusted electronically.

Cable management.

Built-in grommets, channels, or other features to manage cables and wiring.

Modular.

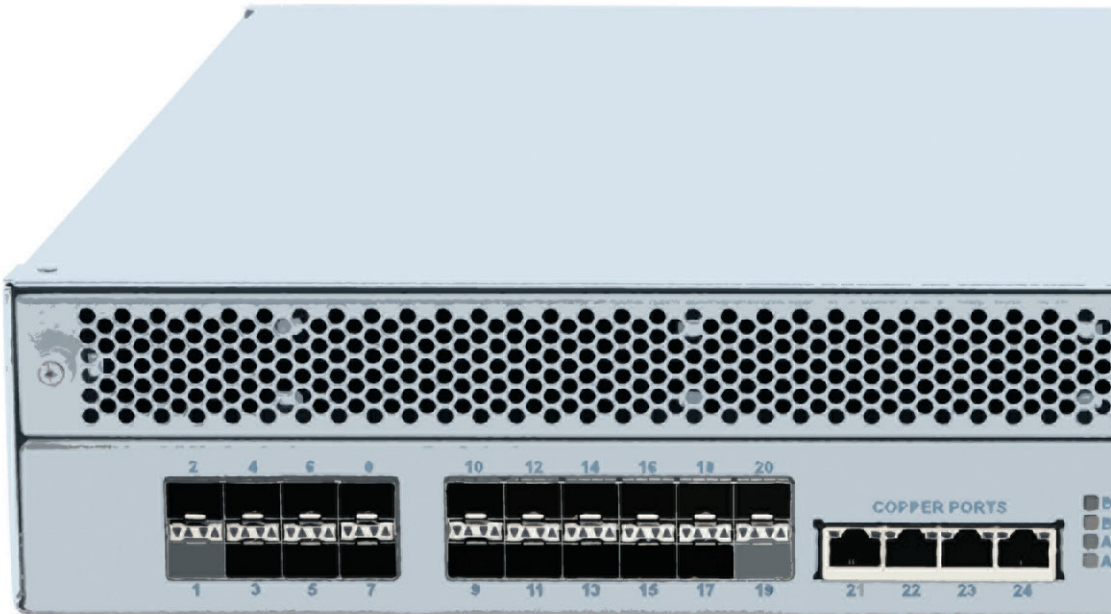
Furniture components that are interchangeable or can be easily modified.

BUYERS’ CHECKLIST

- ✓ **Seek out quality.** Although looking for deals can help companies on a tight budget, sacrificing quality as a result can end up costing companies more in the long term, especially if buying from vendors that don’t offer lifetime warranties on furniture.
- ✓ **Know the delivery terms.** Before buying furniture, determine if the delivery includes bringing it inside the facility, requires a lift gate or loading dock, and includes assembly or puts the responsibility on you or a third-party installer.
- ✓ **Go modular when possible.** Buying components that are interchangeable lets you modify the setup to meet changing needs, including downsizing or expanding space. Increasingly, individual furniture units can be mixed and matched and layout configurations easily altered.
- ✓ **Build vertically.** Purchase components that support building vertically for better space efficiency.

BUYING TIPS:

Networking



THE HEALTH of a company’s network is crucial to its productivity. As such, choosing the right equipment to run your enterprise network can’t be taken lightly. As you evaluate how you’re going to manage your unique network and improve metrics overall, here’s what to watch for.

✓ *Seek Advice*

The road leading up to actually buying next-generation network gear should be filled with staying current on standards, protocols, and vendors’ proprietary features. Doing so, says Rob Enderle, principal analyst for Enderle Group, can save time in narrowing down vendors and exactly what equipment is available that can meet specific needs. “Like a fine wine, you don’t implement a standard before it’s time, but you don’t want to be excessively late, either,” Enderle says. “Otherwise, you’ll likely pay a premium for aging technology. Stay informed.”

✓ *Look For Cost-Effective Upgrades*

It’s important for small to midsized enterprises to look for ways to upgrade networking equipment cost-effectively. Eric Hanselman, research director, networks, at 451 Research, says a first step is assessing the performance of the various components of the network. Surveying network performance can pinpoint whether core, edge, or access are areas that need attention. Wireless performance can be more complex to accurately assess, Hanselman says. Because the radio frequency performance varies with physical building constraints and the wireless devices involved, companies may need to enlist expert help. “Simply adding more access points can often make a bad situation worse,” he says. Alan Weckel, Dell’Oro Group senior director of data center appliance, enterprise telephony, and Ethernet switch market research, says that reducing spare capacity is the biggest way to cut costs.

✓ *Go To The Core*

Core network upgrades can add capacity that elements at the network edge can leverage, Hanselman says. “This is a good investment if there is congestion in the core, and this is often the case,” he says. “If access performance is a bottleneck, either for devices or for traffic headed to the Internet or wide area network, a core upgrade won’t make a noticeable difference.”


One possibility for cutting costs when upgrading core networking gear is acquiring used or refurbished components. Hanselman says such gear can offer reasonable value, “as long as it’s still actively supported by the manufacturer.” Support, he says, must include the firmware and OS. “For some manufacturers, equipment components can be upgraded without replacing a whole chassis,” he says. “Control or supervisory module upgrades may be available in both new and refurbished equipment.” Weckel sees this approach more as an option for smaller enterprises, “as a switch from a Fortune 50 company that is three years old is still probably feature-rich for what an SMB may need.”

✓ *Bargain For Better Prices*

Vendors are often willing to get aggressive with pricing, especially if

they know competitors are in the picture. Pin your list down to two or three vendors that you’ll be happy with and then start bargaining. Where the ideal time to buy is concerned, Enderle says it’s helpful to have someone you trust who is active in the standards efforts in on the decision “so they can tell you of the pitfalls and help you with timing,” he says. “This ensures you neither buy early nor late.”

✓ *Take Your Time*

Spending the time necessary to implement a network refresh correctly can result in time and money savings later. “Much of the cost connected to any technology change is the result of mistakes that result in the firm buying what they don’t yet and may never need and in undoing bad decisions,” Enderle says. 

BUYERS’ CHECKLIST

- ✓ Is the product designed for the needs of a small to medium-sized enterprise?
- ✓ Is purchasing used equipment an option?
- ✓ Are we up to date with current standards and protocols?
- ✓ Is this upgrade something we will take advantage of now or in the near future?

KEY TERMS

Gigabit Ethernet (GbE).
Technology for transferring information at the rate of 1 billion bits per second. Other high-speed standards include 10GbE, 40GbE, and 100GbE.

IPv6.
A communications protocol designed to replace IPv4 and prevent the problem of running out of potential IP addresses. IPv6 uses 128-bit addressing, compared to IPv4, which uses 32-bit addressing.

BUYING TIPS: KVMs



THERE’S LITTLE DOUBT that KVMs offer plenty of options. Brett Femrite, Rackmount Solutions director of business development (866/207-6631; www.rackmountsolutions.net), says models include simple desktop options that control a handful of computers up to enterprise-level, IP-based KVMs with integrated matrix switching that let multiple users simultaneously access different devices.

✓ *Pick A Knowledgeable Vendor*

Most people purchasing KVMs are familiar with KVM switching technology, but they are not so well-versed in the available offerings, says Jeff Clark, president of Lindy USA (888/865-4639; www.lindy-usa.com).

If you don’t have time learn about all of the offerings, carefully consider the aptitude of the vendor partner you are working with, Clark says, and be transparent about your needs and future growth plans.

Earl Stout, vice president of sales and product development at Lanstar (800/474-3947; www.lanstar.com), says you need to make sure you’ll get the upfront and back-end support you may need. “Work with a knowledgeable and reliable vendor to help you with the process. It will save you time and money.”

✓ *Consider Security*

Buying a KVM with secure IP remote user access is essential for reducing manpower and negating the need for onsite operation by enabling administrators to gain BIOS-level access to servers, says Anthony Yim, general manager of Austin Hughes Solutions Inc. (510/794-2888; www.austin-hughes.com).

Femrite says you need to consider automatic time out, which disconnects users after a specified period of inactivity. A priority feature for data centers with multiple users accessing the enterprise’s devices is permissions-based access rights, which grants specific users access to only the devices and administration levels they need.

✓ *Factor In Compatibility*

Be sure to account for compatibility, Femrite says. Determine the number of devices you want to connect, hardware devices you’ll connect to it (mouse, keyboard, monitor), and the connection types (USB, PS/2) you need. Compatibility with the monitor you’ll connect the KVM to (DVI or VGA) is also essential.

✓ *Check For Devices & Users*

KVMs have a limited number of servers and devices they can directly control. Will Beene, rack specialist and technical account manager at Rack Solutions (888/903-7225; www.racksolutions.com), says you need to know how many users can be supported both locally and remotely. KVMs are offered in a variety of port densities, so you should be able to find one that perfectly fits your needs.

Yim says you can reduce KVM hardware expenditure and simplify management with a KVM that offers simultaneous multiuser access from different locations on devices connected to the same KVM switch.

✓ *Determine The Distance*

Determine the maximum distance you need to connect devices to the KVM. “If

further than approximately 25 feet, you should opt for a CAT5 cable vs. the standard KVM cable kit,” Femrite says. If the servers are too far away for the cabling to reach, you may need to invest in a KVM extender.

Yim adds that new CAT6 KVMs can minimize distance-related problems as a CAT6 cable with interface dongle can support up to 130 feet without signal weakness.

You could also invest in KVM over IP, which lets staff control servers from anywhere using an Internet connection. The KVM over IP switch will also feature an encryption protocol that will help secure the data you send over the network.

“KVM over IP allows the servers to be further away from the KVM switch; however, Service Access Modules (SAMs) are required,” Beene says. “You have to weigh the cost vs. the benefits. In large organizations with distributed systems, KVM over IP is an easy method of administration and management.”

✓ *Check Management Options*

Lanstar’s Stout says you need to ensure the KVM system has tools for you to view, access, and manage the data center based on your standards. “Many data centers need to access devices both locally, at the rack in the office, and remotely anytime, anywhere. The software must make it easy to manage the data center and the users.”

✓ *Plan For The Future*

Be sure to factor in future additions or purchase a KVM that can daisy chain or cascade to avoid having stranded assets you outgrow, Femrite says. Pay attention to the cost, benefits, and expandability of the KVM switch.

KEY TERMS

Cascading.

Connecting KVM switches together in a chain by attaching one switch to the computer port of another.

Converter.

Converts the KVM signal from one platform to another.

KVM extender.

Allows the KVM signal to travel over a greater distance than it would have previously.

KVM sharing.

Enables multiple users to access the same KVM.

Matrix switching.

The ability to have multiple users access multiple target devices independently.

KVM over IP.

The ability of the local or remote user to monitor and access the entire data center and remote offices over the Internet using a Web-based browser.

BUYERS’ CHECKLIST

Anthony Yim, general manager of Austin Hughes Solutions Inc. (510/794-2888; www.austin-hughes.com) offers this list of features to look for:

- ✓ Do you need traditional DB-15 cables or CAT6 cables with an interface dongle?
- ✓ Does the KVM support secure IP remote access?
- ✓ Do you need a single local console or multiple consoles with IP remote access features?
- ✓ Will the KVM be standalone or integrated with an LCD keyboard drawer?
- ✓ Will you have a single user or concurrent users?
- ✓ Does it have multiplatform connectivity so you can mix legacy hardware platforms between DVI, USB, PS2, and Sun solutions?

BUYING TIPS:

Data Center Cleaning Services



A CLEAN DATA CENTER IS CRUCIAL to maintain the performance of your physical infrastructure and the productivity of your workforce, but you can't rely solely on your janitorial staff to get the job done. Here's what to look for when hiring a data center cleaning service.

✓ *Check For A Service Provider's Experience & Reputation*

It's important that you don't rush into choosing a data center cleaning service, because there are multiple factors to consider that may make one firm fit your needs better than another. Not every data center is created equal, and many data centers have unique cleaning needs that not all cleaning services can address.

You should not only research what cleaning firms offer, but also look at their reputation and guarantees. You must make sure the provider has years of training in cleaning data center environments, including floors, ceilings, cases, internal components, and much more. In addition, cleaning companies should follow ISO 14644 standards, have experience cleaning ISO class 8 environments, and know how to address airborne contamination and particulate migration.

To help narrow down your list of choices and help you make an informed decision, also find out exactly what services a cleaning firm offers and what kind of quality you can expect. The cleaning service should also be able to provide a detailed list of what it cleans and how thorough it will be.

✓ *Understand Your Costs*

Cost for cleaning varies depending on what a provider offers as well as its reputation. But don't let price fool you. A lot of factors go into the overall price of a cleaning service, and you should make sure you get exactly what you're paying for.

Be sure to look at what is being cleaned for the price you pay and the level of cleaning being performed. There may be specific situations, such as after construction or in the wake of a disaster, where you will need more in-depth cleaning services than on an annual floor cleaning. One type of cleaning may take more time than another, which could affect the overall pricing of the service, as well.

✓ *Know What Needs To Be Cleaned*

Some parts of your data center will need to be cleaned annually, while others will require quarterly or biannual cleanings. But it's a fairly safe bet that, at some point, everything in your data center will need to be cleaned. Create a cleaning schedule for the building itself as well as the equipment. And stick to the plan.

Make sure your cleaning schedule covers all access floors and floor panels, walls, ceilings, light fixtures, server racks, UPS

units, panels, and more. The best cleaning firms have practices in place that will leave no stone unturned.

✓ *Set Clean Policies*

Between cleanings, institute policies that limit the access employees have to certain areas of the data center as well as what they can bring into the room itself. If you can get your employees to treat the data center as a sterile environment and decrease the amount of foreign contaminants, it will make the cleaning crew's job easier and potentially lower your costs. **P**

BUYERS' CHECKLIST

- ✓ Get a detailed scope of work.
- ✓ Require that employees be background-checked and drug-screened.
- ✓ Periodically check the work in progress.
- ✓ Limit what types of liquids and/or chemicals are allowed in the data center.

KEY TERMS

Airborne contamination.
Gaseous and particulate contamination that can lead to equipment failure; often gauged by particulate sampling.

ISO 14644-1.
An international standard for air cleanliness in cleanrooms and associated controlled environments.

Particulate migration.
The movement of contaminants from one sector or piece of equipment to another, often as a result of the contaminant changing form as it's crushed and spread.

Plenum.
An enclosed space (often beneath floors or in ceilings) used for HVAC, cabling, etc.

BUYING TIPS:

Understand The Used Equipment Market

✓ Know What The Gray Market Is

Ask a group of IT professionals what the gray market is, and you'll likely get a variety of answers. Is it knock-off equipment from overseas? It is equipment with dubious origins? The answer to both is a vehement "no." The common definition of the gray market is "the sale of equipment through channels that aren't licensed or authorized by the original manufacturer," and it's both legal and legitimate.

The stigma—and confusion—associated with the gray market has prompted many resellers to undertake an ad-hoc rebranding campaign. "Used market" suffices for many, while others prefer "green market," pointing to the environmental advantages of keeping equipment in the marketplace and reducing landfill materials. Whatever you call it, the gray market offers smart buyers quality equipment at attractive prices.

✓ Know Sources For Used Equipment

Concerns about the origin and authenticity of used equipment continue to dissuade enterprises

from giving the secondary market a serious look. But instead of shying away from the refurbished route, organizations should embrace the amount of high-quality used equipment currently available. Typically, used equipment comes from three different sources: direct from other data centers that are upgrading, equipment coming off lease, and asset recovery or disposal channels such as banks, auction houses, and salvage companies that have been called in to help recover cash from businesses that have downsized or gone out of business.

✓ Learn What Items Make Sense To Buy Used

Darin Stahl, Info-Tech Research Group analyst, says the economic downturn and virtualization have caused enterprises to view their equipment differently. "The refresh cycle on the equipment has gotten longer, so what that means is there's less available used equipment because they're hanging on to this stuff and wringing every ounce of usefulness out of it," he says. For example,

the most common refresh point for servers is five years, but Stahl says 22% of his customers are pushing that to six-plus years. Less than 14%, he says, are refreshing servers at the three-year mark.

Along those lines, Stahl says, UPSes, HVACs, and other data center equipment had been good candidates for recycling and/or reuse, but companies now aren't typically refreshing these until the seven-year mark. In the past, he says, this wasn't a big deal, but "what's gone on if you start looking at the efficiencies in a precision cooling system or an HVAC unit for a server room that's five years old, that delta between what you bought five years ago or seven years ago is very dramatic. For me to go out as a buyer, the market just isn't there. Maybe I save some CAPEX, but I more than consume that in OPEX because of efficiency loss if I'm buying used gear." Still, he says, there's a healthy market for such used equipment as racking equipment, raised flooring, and generators.

✓ Go With An Established Reseller

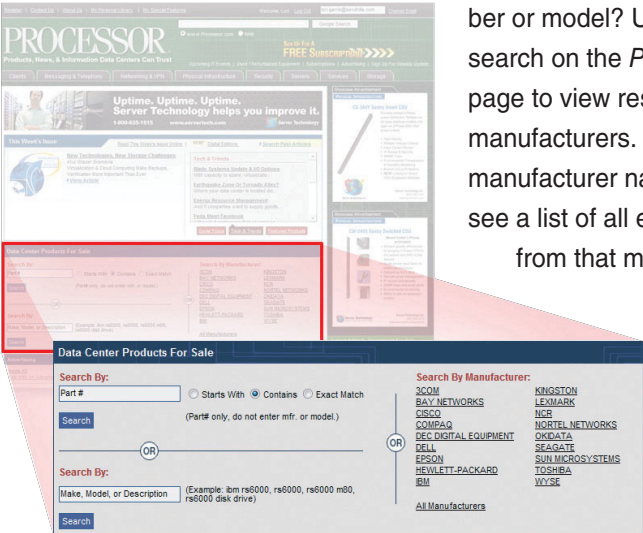
There's no shortage of sources for used and refurbished gear, whether it's via company bankruptcies, liquidators, leasing companies disposing of hardware rotated out of service, and so on. The gamble, though, is that not all used equipment dealers may thoroughly test the equipment, load it with the proper firmware, properly pack it for shipment, or be ready to furnish support if there's a problem. Be sure you've thoroughly vetted any company you're purchasing from and that you understand what testing and repair the equipment has gone through.

USE PROCESSOR.COM TO FIND DATA CENTER EQUIPMENT

Looking for help pinpointing the products you need, from vendors you can trust? Finding the equipment you need is easy with *Processor's* online Data Center Products For Sale database.

From *Processor's* home page (www.processor.com), you can search for a specific part number, make, model, or description. Enter the information in the appropriate box and click Search. You'll see a list of available equipment. If you don't see the particular piece you're looking for, scroll to the bottom of the search results page to conduct a more detailed search. There, you can search by part number, model, price, location, and more.

Don't know the specific part number or model? Use the drill-down search on the *Processor* home page to view results from specific manufacturers. Simply click the manufacturer name, and you'll see a list of all equipment listings from that manufacturer.

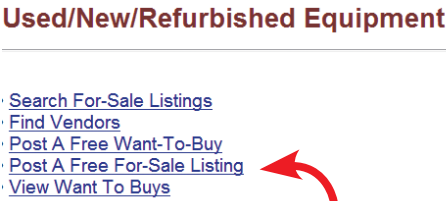


Do you have excess equipment?
Post it for sale on Processor.com!

On the Processor.com home page,
click Used/Refurbished Equipment.



Choose
Post A Free
For-Sale Listing.



Follow the on-screen directions from there!

BUYING TIPS:

Cable Management Solutions



MANAGING CABLES is an afterthought. That’s an unfortunate reality among many data centers, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). Among other things, not having a cable-management plan and guidelines makes troubleshooting problematic.

✓ *Know What’s Available*

Brett Femrite, sales manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says well-designed patch cable storage managers, which house and cover patch cords between patch panels and devices, are popular. He says they are not only functional in helping reduce cable sprawl, but they are also bend-radius-compliant and offer cosmetic appeal. Other cable management options include horizontal and vertical wire managers (which can be mounted on the front or rear of your equipment rack or cabinet), cable ladders, a large assortment of cable trays and conduits, and various wire minders (rings) that can be mounted on any rack system.

Also very popular, Femrite says, are vertical and horizontal lacer bars. “These bars can be mounted on a rack or within a cabinet and have slots through which Velcro enclosures or cable wraps are routed to hold groups of cable,” he says.

✓ *Plan For Expansion*

Laura Viars, senior sourcing specialist at Rackmount Solutions, says if you intend to incorporate more equipment in the future, ensure your cable management configuration allows for it. Do this by making certain managers (both in-rack cable managers and external trays and ladders or conduits) don’t meet or exceed their fill capacities. Most management options are available in multiple sizes, she says, ensuring a fit with plenty of excess if needed.

Also seek solutions with the flexibility to add new equipment or troubleshoot an existing component. “Lean toward reusable options such as Velcro straps in lieu of cable ties and managers that allow easy access to their contents,” she says. Have an idea of when you’re looking to expand and by how much. If you expect rapid and near-term growth, keep cables loosely organized during implementation by cutting down on the bundling and by using managers (D-rings vs. managers with covers) offering easier access.

✓ *Check Vendor Experience, Warranties & Other Factors*

Because cable management systems affect a range of data center infrastructure sub-systems, including airflow management and mechanical and electrical distribution, Lars Strong, senior engineer at Upsite Technologies (888/982-7800; www.upsite.com), says a vendor needs to have comprehensive knowledge of data center operations.

Vendors should have experience that matches your business size and type, warranty products and work, offer easy ordering, provide complete solutions and knowledge concerning network configurations, carry parts that fit into your existing

systems, and guarantee installation and network performance.

✓ *Consider Color & Labeling*

Koty says when possible, use color coding to help visually identify cables quickly, simplify management, and save time when tracing cables. With data cables, use color to identify the cable’s role/function or connection type. With power cables, use color to identify and organize dual-power feeds for redundant power sources.

Secure labels so they’re accessible but difficult to remove. Also, maintain a spreadsheet that identifies the cables and colors, where cables come from and go, and configurations.

BUYERS’ CHECKLIST

- ✓ **The basics.** Laura Viars, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says no matter the size of installation planned, you’ll likely need basic management items such as vertical managers to bundle cable along the height of the racks/cabinets; horizontal managers to bring the cabling neatly from the drop to the equipment; and Velcro straps to bundle cables as needed.
- ✓ **Testing.** Pre-test all cable before installing, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). Once installed, it’s more difficult to test and identify problems.
- ✓ **Think about heating and cooling.** Where heating and cooling efficiency are concerned, Koty says, using overhead racking for network and storage cables will prevent air dams from forming under the floor. Also, be sure your cable management solution keeps cabling out of the way of exhaust fans in cabinets, he says.

KEY TERMS

- Cable bend radius.**
The minimum radius a cable can acceptably bend and still function as intended.
- TIA/EIA.**
The TIA (Telecommunications Industry Association) and EIA (Electronic Industries Alliance) provide best practice guidelines regarding cabling infrastructure.

BUYING TIPS:

Fire Protection



IN AN INSTANT, a data center fire can devastate a business. Beyond downtime, there's equipment damage, escalating insurance rates, and other related costs to deal with—hence the need for fire protection and suppression systems. Here's what you need to know when selecting a fire protection system for your data center.

✓ *Understand The Basics*

Chris Jelenewicz, P.E., engineering program manager at the Society of Fire Protection Engineers, says there are several factors to consider when installing fire protection systems, including the building's structure, occupants, first responders, and equipment. Jelenewicz says both active fire systems (sprinkler, gaseous, alarm and communications, smoke management, etc.) and passive fire systems (fire doors, walls, etc.) are necessary to adequately protect people, property, and structures. What's important, he says, is that both system types "should be designed so that they work together as one complete fire protection system."

Melanie Davy, analyst at Info-Tech Research Group, says at a minimum, a data center must have a sprinkler system, fire detection and alarm components, portable fire extinguishers, and emergency power-off abilities (according to NFPA 75). Other forms of protection, such as clean-agent suppression systems, are classified as add-ons.

✓ *Decide Between Water & Non-Water Options*

Fire protection is generally broken down into water and non-water options. The obvious downside to using a sprinkler system is that electronic devices and water can be a bad combination, especially in situations that are started by electrical fires. Thus, most data centers opt to go with a clean agent or aerosol agent suppression system, which is designed to leave no residue and is safe for both electronics and people, unlike some chemical-based fire protection.

✓ *Know Your Alert Choices*

Regardless of which type of suppressant you select, you'll need to know at what stage during a fire the detection system should trigger the suppressant to release. Effective detection is key, as the suppression system is only as good as the detection system initiating the release.

You'll need to invest in a smoke and fire detection system that can alert employees and IT staff to problems. Some models are capable of detecting the various stages of a fire, such as visible smoke vs. flaming fire vs. intense heat, to allow you to set off alarms or activate various stages of fire protection. ■

BUYERS' CHECKLIST

- ✓ Find a smoke/fire detection system that meets the needs of your data center, in terms of stages of fire protection and number of physical detection locations.
- ✓ Research the various clean agent suppression options and make sure your sprinkler system is capable of working with the clean agent suppression system.
- ✓ Invest in an emergency power off system to shut off electricity when a fire is detected.

KEY TERMS

Aerosol agent.

A type of fire suppressant system that leaves little residue and won't damage equipment. Although aerosol agents require a contained space, a sealed air-tight space is not required as the agent does not pressurize the protected area when discharged.

Agent storage container.

The assembly or unit that stores the clean agent fire suppression liquid until it needs to be released when prompted by the suppression control panel.

Class C.

Fire breakouts that involve electrical equipment where a non-conductive extinguishing agent must be used.

Clean agent.

A type of fire suppression system that leaves no traces behind.

Deluge.

A system where all the sprinklers connected to the water piping system are open. If the deluge valve opens due to a signal, the entire area will be sprayed with water.

Early warning smoke detector.

A passive detector that uses ionization and photoelectric sensors.

Heat detector.

A unit that sends a response when the convection of thermal energy changes the temperature of the device's heat-sensitive element.

Suppression control panel.

The unit that houses the interface you use to control the fire protection system.

Very early warning smoke detector.

A smoke detector that samples air particles via aspiration to find non-visible smoke.

BUYING TIPS: PDUs



PDUs HAVE EVOLVED into integral components of a modern power distribution infrastructure, delivering correct voltage and current to multiple outlets.

Jim Fink, consultant at Upsite (888/982-7800; www.upsite.com), says that a PDU can refer to several different pieces of equipment. “Some manufacturers call the power strip mounted in the IT rack a PDU. More traditionally, PDU refers to a large floor-standing device with a rating of up to several hundred kVA that distributes power from one or more feeders to multiple branch circuits,” he says.

✓ *Know Your Needs*

Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says to do your homework prior to making a PDU purchase. “It is critical that the PDU you select match up with your power consumption needs and server/network equipment,” he says.

Make note of whether you can daisy-chain for added capacity, which could save money down the road. Femrite says other key factors to consider include form factor (vertical/horizontal, rack/wall-mountable, or 0U) and the amperage the PDU needs to support.

When you’re evaluating PDUs, be sure to perform full load testing to determine heat rise of the internal connections, says Alex North, director of business development at BayTech (800/523-2702; www.baytech.net). And make sure the PDUs you purchase have the correct outlets and outlet counts, says Andy Grav, technical sales engineer at HM Cragg (800/672-7244; www.hmcragg.com).

✓ *Understand The PDU Options*

“There are generally three types of PDUs: basic, metered, and switched,” Femrite says. A basic PDU lacks monitoring and remote administration capabilities. A metered PDU has everything a basic PDU has but adds a meter that lets users visually track amperage and management software that lets users monitor the aggregate current being drawn on each PDU. Switched PDUs support everything on a metered PDU and add local and remote control capabilities on a per-outlet level. Redundancy is also important, Femrite says. A dual-circuit PDU offers added fault tolerance with two power inputs.

Today’s lights-out data centers are typically using switched and managed PDUs, Grav says. “Both of these options allow the end users to monitor the data center from a distance while still having control of the equipment by remotely logging into the PDU and being able to cycle stuck equipment off/on


while not having to deploy anyone onsite to turn a piece of equipment off and on,” he says.

BayTech’s North says most rack PDUs look similar. “Evaluators need to open up the hood of all PDUs they are considering and use sound engineering-based judgment to evaluate the method of power distribution the manufacturer employed in the strip.”

✓ *Account For Growth*

Make sure the PDU can handle your needs both now and into the future. “If you don’t

precisely match up the PDU with your power consumption needs, taking into account anticipated growth/increases, you can wind up having a breaker tripped,” Femrite says.

But, Fink says, be careful not to oversize the PDU. “Consider serving new growth zones in the data center with new PDUs when the time comes rather than from grossly oversized PDUs purchased now.” Also, if you need to add branch circuits to existing PDUs without a shutdown, some PDUs can do that while the PDU remains energized. 

BUYERS’ CHECKLIST

- ✓ **Have an understanding of what you need to accomplish.** Be sure you know how many components you need to plug into the PDU and whether you need a basic, metered, or switched PDU.
- ✓ **Know your numbers.** Determine how much power you’re going to draw and that you have the right voltage and amperage numbers.
- ✓ **Look for environmental monitoring capabilities.** If stability and cooling are a concern, make sure to purchase a PDU with environmental monitoring features and remote access and control capabilities.
- ✓ **Figure out the PDU location.** Verify where your PDU will be located in the data center and what type of rack you have to determine how your PDU needs to be mounted. Also be sure to measure the distance from your PDU to the power source so you’ll know how long your PDU cord needs to be.

KEY TERMS

- Intelligent PDU.**
Any PDU that offers Web-based management, meter power at both the PDU and individual outlet level, and real-time power monitoring.
- Insulation Displacement (ISD).**
A method where the manufacturer displaces the insulation on a wire to bring the power to the receptacle. This is a very high impedance connection and should be considered a potential failure point. A well-constructed PDU will quickly disperse internal heat either through venting, chassis material selection, or both.
- Three-phase wye.**
This system has a neutral wire that allows the three-phase system to provide a higher voltage (line-to-line, e.g. 208V) while still supporting lower-voltage single-phase (line-to-neutral, e.g. 120V) appliances.

BUYING TIPS:

Security



YOU’VE WORKED HARD to build your business up to where it is today, and it’s safe to assume that you’d like to keep it that way. But one major security intrusion can put all of your success in jeopardy. With so many security solutions available on the market, it can be difficult to choose the right ones. Here is some advice on what every enterprise needs.

✓ *Start With Network Access Control*

A network access control solution will limit unnecessary access to your company’s internal resources. If you can prevent outsiders from connecting to your network, then there is a much smaller chance of a security breach. Network access control systems can also be used to monitor the mobile device connections of employees working outside the company. Smartphones and tablets are becoming popular targets for hackers, so checking to make sure the external connection is safe and secure will go a long way toward preventing a potential intrusion.

✓ *Move Up To Unified Threat Management*

A UTM solution goes a bit beyond network access control by essentially creating a gateway through which all users and data has to pass before it lands on your company’s internal infrastructure. UTM combines intrusion prevention, antivirus, antispam, and many other features into one solution designed to protect your company.

✓ *Don’t Forget Email Security & Encryption*

Receiving malware-filled messages can result in the infection of one computer or the infrastructure of the entire company. And sending messages with sensitive information no matter what the reason is always a dangerous proposition. As one of the most basic measures, every company should have some form of encryption attached to its email systems. Encryption helps ensure that even if an email is intercepted, it is less likely that a hacker will be able to mine anything from it.


Along with encryption, you’ll want to invest in strong antivirus protection to protect servers and endpoints against malicious code and viruses. Make sure the antivirus program you purchase automatically downloads and deploys signature files all the way to the endpoints.

✓ *Add In Data Loss Protection*

An enterprise DLP (data loss prevention) solution can “offer a lot of capability in terms of preventing the egress of data,” says James Quin, lead analyst at Info-Tech Research Group. Such solutions can be expensive, so finding existing tools with DLP capabilities (up-to-date network perimeter UTMs and comprehensive endpoint anti-malware packages) can “deliver at least a moderate level of protection without the excessive cost,” he says.

✓ *Check For Updates & Upgrades*

Once you’ve purchased and installed your security solutions, the best way to protect your security investments is to regularly update them with free releases and consider upgrading to new versions of the software whenever possible.

Check to see if your security vendor will set up a long-term upgrade plan that will help cut down on costs. As long as it’s financially feasible and provides new functionality, updates and upgrades are great ways to lengthen the life of your security solutions. 

BUYERS’ CHECKLIST

- ✓ Does the solution allow you to limit access to the network and block unwanted connections?
- ✓ Can the solution provide a perimeter defense that prevents threats from landing on your servers and other internal equipment?
- ✓ Emails make it easy to infect computers with viruses and send out sensitive data to hackers, so you should invest in a strong email encryption solution.
- ✓ Will the vendor help you set up an update and upgrade plan that will let you keep your security solutions up to date without breaking your budget?

KEY TERMS

Mail transfer agent (MTA).

A solution that catches and checks incoming email for threats before transferring it to your internal email platform.

Network access control.

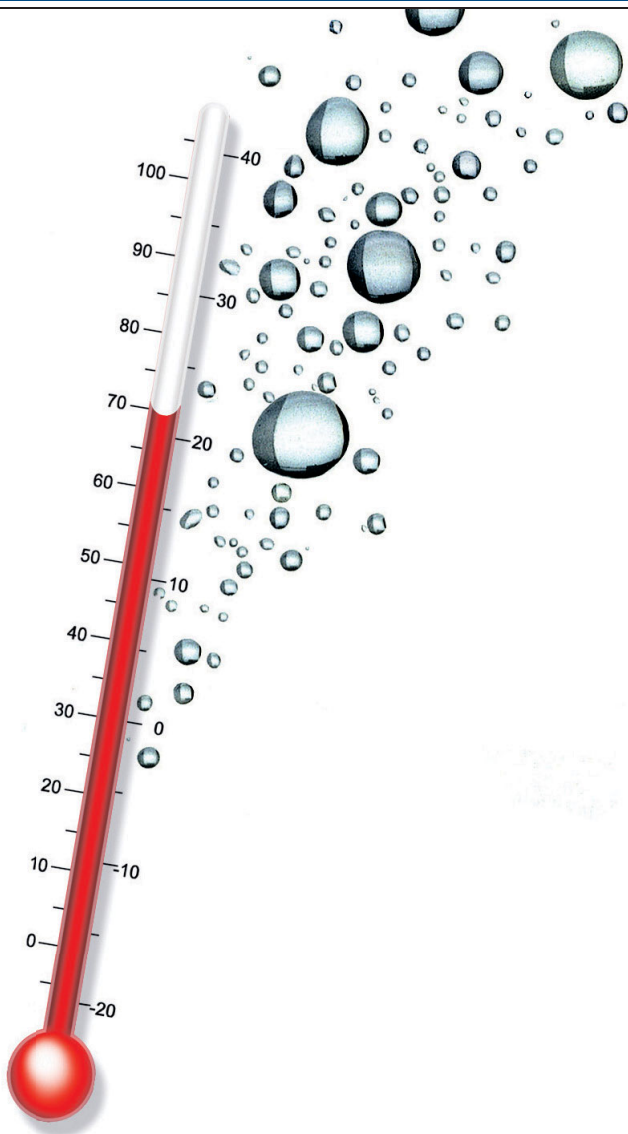
A solution that helps you limit access to your network and lower the chance of an infiltration.

Unified threat management (UTM).

Software (often installed on a managed appliance) that seeks to comprehensively block malware and network threats through features such as a firewall, antivirus, antispam, intrusion prevention, VPN, access policy enforcement, and more.

BUYING TIPS:

Environmental Monitoring Equipment



ENVIRONMENTAL MONITORING offerings are not things an enterprise invests in on a whim. Every organization has unique infrastructure limitations, climate issues, and monitoring needs, so there’s no one-size-fits-all solution. Here’s what to look for.

✓ *Define Your Goals*

Jim Fink, consultant at Upsite (888/ 982-7800; www.upsite.com), says you need to first define your goals in implementing a monitoring system, including whether you’ll be using it for troubleshooting, efficiency benchmarking and goal tracking, trend analysis, forensic analysis, or other issues.

“Decide which parameter must be monitored (pressure, temperature, humidity, etc.) and understand the installation and IT burden on your organization. How many IP addresses, how many monitoring points, and how much network traffic will be created? Will you use wireless or wired sensors? How will the data be presented?”

Laura Viars, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says you also need to know what types of threats might occur. “The most common environmental risk is excessive heat within the cabinets, so you’ll definitely want to make sure you are monitoring temperature,” she says. Other potential environmental dangers include power surges/loss of power, humidity, smoke, airflow, and room/cabinet entry.

✓ *Understand The Options*

With so many choices, it’s tough to know where to start. Harry Schechter, founder and CEO of Temperature@lert (866/524-3540; www.temperaturealert.com), says ease of use and reliability are the two most important features to look for. “Choose a product that provides just the features you need, and this will ensure you’re getting something that will be intuitive to set up,” he says.

When it comes to connecting monitoring equipment to the network so that it can send alerts, several options exist, Schechter says. USB, Wi-Fi, and Ethernet remain popular, but there are also newer infrastructure-independent devices based on cellular phone connections.

No matter what system you buy, make sure you get all the components to

complete the system, Viars says. “Most systems have a main console, and in addition to that, you’ll need to purchase various sensors based on what you are looking to monitor specifically.” Some sensors might require a power source, so consider that when planning your layout.

✓ *Install & Monitor*

A state-of-the-art environmental monitoring system is nothing without notifications. Bob Douglass, vice president of sales and marketing at Sensaphone (877/373-2700; www.sensaphone.com), says, “The primary motivation for adding an environmental monitoring system is to know when you have a problem as soon as possible.” Common notification options include email, LEDs, audible alarms, beacons, sirens, Web alerts, SNMP, automated phone calls, and SMS.

To avoid false alarms after you’ve installed your environmental monitoring solution, let the monitor run for a few hours so you can see the natural cycle of temperature and other sensors, Schechter says. Once you have a chance to review what a “normal” graph or sensor reading looks like, you can set an appropriate high/low threshold, Schechter says.

✓ *Consider Long-Term Support*

Choosing the right solution means little if you don’t have long-term support, says Michael Sigourney, senior product specialist at AVTECH (888/220-6700; www.avtech.com). “Look beyond the checklist and make sure that you’re getting future enhancements, that you have access to support, and that the company stands behind its products.”

BUYERS’ CHECKLIST

- ✓ Do you need to monitor remote or local systems?
- ✓ Do you have wired networking or power limitations?
- ✓ What kinds of notifications do you need?
- ✓ Do you have other monitoring needs beyond environmental?
- ✓ How many and what types of sensors do you need?

KEY TERMS

Dry contact.

Refers to an electrical contact that has no internally available voltage.

SEMS (Server Environmental Monitoring System).

Records and reports the environmental conditions of servers and clients.

SNMP (Simple Network Management Protocol).

A network protocol that lets users monitor network availability and performance in addition to a variety of other devices such as power and cooling systems.

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At These IT Training & Association Meetings Across The United States

JANUARY

AITP Washington, D.C.

Jan. 10
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

AITP Lehigh Valley

Jan. 16
The Starlight Diner
233 North Route 100
Allentown, Pa.
www.lv-aitp.org

BICSI Winter Conference

Jan. 20-24
Tampa Convention Center
333 N Franklin St.
Tampa, Fla.
www.bicsi.org/winter

AITP California Southland

Jan. 23
Garden Grove, Calif.
www.aitpcalsouthland.org

AITP Wheeling

Jan. 23
White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
www.aitp-wheeling.org

ISSA Baltimore

Jan. 23
Concurrent Technologies Corp.
8530 Corridor Road
Savage, Md.
www.issa-balt.org

Fundamentals of Windows Server 2008 Network & Applications Infrastructure

Jan. 25
New Horizons DC
1331 F St. NW, Suite 240
Washington, DC
www.dcnewhorizons.com

ISSA Inland Empire

Jan. 29, 6:30 to 8:30 p.m.
Coco's Restaurant
Upland, Calif.
ie.issa.org

FEBRUARY

Network + Certification

Feb. 4
New Horizons Tysons Corner
2010 Corporate Ridge, McLean, Va.
www.dcnewhorizons.com

AITP Washington, D.C.

Feb. 14
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

Installing & Configuring Windows Client 7

Feb. 18
New Horizons DC
1331 F St. NW, Suite 240
Washington, DC
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AITP Lehigh Valley

Feb. 20
LCCC
4525 Education Park Drive
Schnecksville, Pa.
www.lv-aitp.org

AITP Wheeling

Feb. 20
White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
www.aitp-wheeling.org

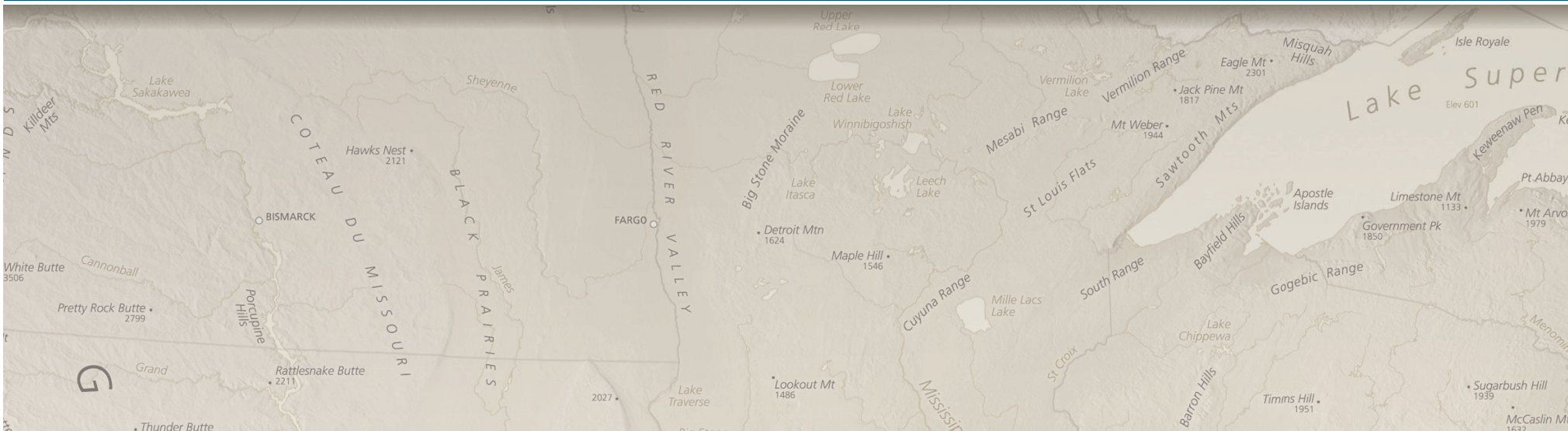
Project Management

Feb. 25
New Horizons Tysons Corner
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McLean, Va.
www.dcnewhorizons.com

ISSA Inland Empire

Feb. 26, 6:30 to 8:30 p.m.
Coco's Restaurant
Upland, Calif.
ie.issa.org

Upcoming IT Events



AITP California Southland

Feb. 27

Garden Grove, Calif.
www.aitpcalsouthland.org

MARCH

AITP Delaware

March 1, 5:30 to 8 p.m.

Wilson Graduate Center

31 Reads Way

New Castle, Del.

www.aitp.org/members/group_content_view
.asp?group=75724&id=100570

SharePoint Technology Conference

March 3-6

San Francisco, Calif.

www.sptechcon.com

AITP Washington, D.C.

March 14

Alfio's La Trattorio Restaurant

4515 Willard Ave.

Chevy Chase, Md.

www.aitpdc.org

Planning & Managing Windows 7 Desktop Deployment

March 18

New Horizons Tysons Corner

2010 Corporate Ridge

McLean, Va.

www.dcnewhorizons.com

Configuring & Managing Microsoft SharePoint 2010

March 25

New Horizons DC

1331 F St. NW, Suite 240

Washington, DC

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ISSA

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March 26, 6:30 to 8:30 p.m.

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Mastering Microsoft Project 2010

March 27

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www.dcnewhorizons.com

APRIL

Big Data TechCon

April 8-10

Boston, Mass.

www.bigdatatechcon.com

AITP Washington, D.C.

April 11

Alfio's La Trattorio Restaurant

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Chevy Chase, Md.

www.aitpdc.org

AITP California Southland

April 24

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April 24

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www.aitp-wheeling.org

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Send an email to feedback@processor.com.

Processor Solutions Directory

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

To list your company and products, call (800) 247-4880.

PHYSICAL INFRASTRUCTURE



SENSAPHONE[®]
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Sensaphone has been designing and manufacturing remote monitoring systems for more than 25 years and has more than 300,000 of its products in use. Sensaphone's product lineup offers a full range of devices with a broad number of features and applications designed to monitor your entire infrastructure and alert you to changes. All product engineering functions, including hardware and software design and circuit board layout and assembly, are performed at the Sensaphone facility in Aston, Penn.

Products Sold:

Remote monitoring solutions that provide email and voice alarm notification for problems related to temperature, humidity, water detection, power failure, and more.

(877) 373-2700 | www.sensaphone.com

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Future Facilities Incorporated aims to help enterprises improve and manage their mission-critical data centers. Its multifaceted software suite called 6SigmaDC supplies comprehensive 3D modeling of every aspect of data center layout, cooling, power, and even weight. Partners include Intel, Cisco, Dell, and HP.

Products Sold:

6SigmaDC data center modeling and simulation software

(408) 436-7701 | www.futurefacilities.com

PHYSICAL INFRASTRUCTURE



BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

Products Sold:

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- Power transfer switches
- Console management and remote site management

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MESTEX
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4830 Transport Drive | Dallas TX 75247

The Mestex division of Mestek is comprised of seven company brand names: Applied Air, LJ Wing, Aztec, Alton, Temprite, Koldwave, and Sierra. Mestex is involved in emerging technology and product research focused on using energy and water more efficiently, including ways to improve data center efficiency by using outside air, evaporative cooling, and optimized DDC control schemes.

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- Mechanical and evaporative cooling products
- Heating products
- Outside air tempering products
- Packaged evaporative cooling solutions for mission-critical applications

(214) 819-5262 | www.mestex.com

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LANSTAR is a worldwide supplier and manufacturer of durable and innovative Technical furniture. All LANSTAR systems are expertly engineered to be interchangeable providing unparalleled flexibility and value. Our Professional staff, with a consultative sales approach, has been designing and providing solutions that are space effective and increase efficiency in the network environment. Let LANSTAR customize your system to fit virtually any need.

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PHYSICAL INFRASTRUCTURE




PDUsDirect.com is a Master Distributor of select Server Technology PDUs for server and networked environments. PDUs Direct's basic, metered, and switched Rack PDUs provide local and remote power management, power monitoring, and environmental monitoring. We pride ourselves in offering industrial-grade quality products at the lowest prices, with the fastest shipping (most orders shipped within 24 hours) and simplest purchase process. We are the Power Behind the Business.

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AVTECH Software, founded in 1988, is focused on making the monitoring and management of systems, servers, networks, and data center environments easier. AVTECH provides powerful, easy-to-use software and hardware that saves organizations time and money while improving operational efficiency and preparedness. AVTECH products use advanced alerting technologies to communicate critical status information and can perform automatic corrective actions.

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PHYSICAL INFRASTRUCTURE



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PHYSICAL INFRASTRUCTURE




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PHYSICAL INFRASTRUCTURE



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PHYSICAL INFRASTRUCTURE



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